# KRPA-U16

## User Guide

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**Chapter 4: BIOS Setup**

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# Safety information

## Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet before relocating the system.

- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before you add a device.

- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.

- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.

- Make sure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.

- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

## Operation safety

- Before installing the motherboard and adding devices on it, carefully read all the manuals that came with the package.

- Before using the product, make sure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.

- To avoid short circuits, keep paper clips, screws, and staples away from connectors, slots, sockets and circuitry.

- Avoid dust, humidity, and temperature extremes. Do not place the product in any area where it may become wet.

- Place the product on a stable surface.

- If you encounter technical problems with the product, contact a qualified service technician or your retailer.

**DO NOT** throw the motherboard in municipal waste. This product has been designed to enable proper reuse of parts and recycling. This symbol of the crossed out wheeled bin indicates that the product (electrical and electronic equipment) should not be placed in municipal waste. Check local regulations for disposal of electronic products.

**DO NOT** throw the mercury-containing button cell battery in municipal waste. This symbol of the crossed out wheeled bin indicates that the battery should not be placed in municipal waste.

# About this guide

This user guide contains the information you need when installing and configuring the motherboard.

## How this guide is organized

This user guide contains the following parts:

- **Chapter 1: Product Introduction**

  This chapter describes the features of the motherboard and the new technologies it supports.

- **Chapter 2: Hardware Information**

  This chapter lists the hardware setup procedures that you have to perform when installing system components. It includes description of the switches, jumpers, and connectors on the motherboard.

- **Chapter 3: Powering Up**

  This chapter describes the power up sequence and ways of shutting down the system.

- **Chapter 4: BIOS Setup**

  This chapter tells how to change system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

- **Chapter 5: Driver Installation**

  This chapter provides instructions for installing the necessary drivers for different system components.

- **Appendix: Reference Information**

  This appendix includes additional information that you may refer to when configuring the motherboard.

## Where to find more information

Refer to the following sources for additional information and for product and software updates.

1. **ASUS websites**

   The ASUS website provides updated information on ASUS hardware and software products. Refer to the ASUS contact information.

2. **Optional documentation**

   Your product package may include optional documentation, such as warranty flyers, that may have been added by your dealer. These documents are not part of the standard package.

# Conventions used in this guide

To ensure that you perform certain tasks properly, take note of the following symbols used throughout this manual.

**DANGER/WARNING:** Information to prevent injury to yourself when trying to complete a task.

**CAUTION:** Information to prevent damage to the components when trying to complete a task.

**IMPORTANT:** Instructions that you MUST follow to complete a task.

**NOTE:** Tips and additional information to help you complete a task.

# Typography

| | |
|---|---|
| **Bold text** | Indicates a menu or an item to select. |
| *Italics* | Used to emphasize a word or a phrase. |
| <Key> | Keys enclosed in the less-than and greater-than sign means that you must press the enclosed key. |
| | Example: <Enter> means that you must press the Enter or Return key. |
| <Key1> + <Key2> + <Key3> | If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). |
| | Example: <Ctrl> + <Alt> + <Del> |
| **Command** | Means that you must type the command exactly as shown, then supply the required item or value enclosed in brackets. |
| | Example: At DOS prompt, type the command line: |
| | `format A:/S` |

# KRPA-U16 specifications summary

| Model Name | | KRPA-U16 |
|---|---|---|
| **Processor Support** | | 1 x SocketSP3 |
| | | AMD EPYC™ 7002 Generation |
| | | **\* Refer to www.asus.com for CPU support list.** |
| **Form Factor** | | EEB, 12" x 13" (305mm x 330mm) |
| **Memory** | **Total Slots** | 16 (8-channel) |
| | **Memory Type** | DDR4 3200/2933/2666 RDIMM/LR-DIMM/LR-DIMM3DS |
| | | **\* Refer to www.asus.com for the latest memory AVL update.** |
| | **Memory Size** | 32GB, 16GB, 8GB(RDIMM) |
| | | 64GB, 32GB (LRDIMM) |
| | | 128GB, 64GB (LRDIMM3DS) |
| | | **\* Refer to www.asus.com for the latest memory AVL update.** |
| **Expansion Slots** | **Total PCI/PCI-X/ PCI-E Slots** | 5+1 |
| | **Slot Location 1** | PCIe 3.0 x16 (x16 link) FL |
| | **Slot Location 2** | - |
| | **Slot Location 3** | PCIe 3.0 x16 (x16 link, if Slot3 is occupied switch to x8 link) FL |
| | **Slot Location 4** | PCIe 3.0x 8 (x8 link q-switch from slot-2) HL |
| | **Slot Location 5** | PCIe 4.0 x8 (x8 link) HL |
| | **Slot Location 6** | PCIe 4.0 x24 (x16 link + x8 link) HL |
| | **Slot Location 7** | - |
| | **Additional Slot 1** | OCP 2.0 Mezzanine card (x16 link) |
| | **Additional Slot 2** | - |
| **Storage** | **SATA Controller** | CPU Integrated |
| | | 4 x SATA3 6Gb/s ports |
| | | 12 x SATA3 6Gb/s ports by 3 Mini-SAS HD connectors |
| | | 1 x M.2 connector (2242/2260/2280/22110) both SATA & PCIe mode |
| | **NVMe Controller** | 6 x Oculink ports (Gen3 x4 link) |
| | **SAS Controller** | Optional Kits: |
| | | - ASUS PIKE II 3108II 8i-240 PD 2G SAS HW RAID card |
| | | Support SAS 12Gbps |
| **Networking** | **LAN** | 1 x Dual Port Intel I350-AM2 Gigabit LAN Controller |
| | | 1 x Management Port |
| **Graphic** | **VGA** | Aspeed AST2500 64MB |

*(continued on the next page)*

# KRPA-U16 specifications summary

| Model Name | | KRPA-U16 |
|---|---|---|
| **Onboard I/O Connectors** | | 1 x USB 3.0 header (for front panel) |
| | | 1 x USB 3.0 port (Type-A vertical) |
| | | 1 x Micro SD Card slot |
| | | 1 x Serial port header |
| | | 1 x VGA header (for front panel) |
| | | 8 x FAN header (4-pin) |
| | | 1 x TPM header |
| | | 1 x Chassis Intruder header (2-pin) |
| **Rear I/O Connectors** | | 2 x USB 3.0 ports |
| | | 1 x VGA port |
| | | 2 x RJ-45 GbE LAN ports |
| | | 1 x RJ-45 Management port |
| **Management Solution** | **Software** | ASUS Control Center (Classic) |
| | **Out of Band Remote Management** | On-Board ASMB9-iKVM for KVM-over-IP |
| **Weight** | | Net Weight : 1.4 Kg |
| | | Gross Weight : 2.5 Kg |
| **Environment** | | **Operating temperature:** 10°C ~ 35°C |
| | | **Non operating temperature:** -40°C ~ 70°C |
| | | **Non operating humidity:** 20% ~ 90% (Non condensing) |

**\* Specifications are subject to change without notice.**

# Product Introduction

This chapter describes the motherboard features and the new technologies it supports.

## 1.1 Welcome!

Congratulations and thank you for buying an ASUS® KRPA-U16 motherboard!

The motherboard delivers a host of new features and latest technologies, making it another standout in the long line of ASUS quality motherboards!

Before you start installing the motherboard and hardware devices on it, check the items in your package with the list below.

## 1.2 Package contents

Check your motherboard package for the following items.

|  | Standard Gift Box Pack | Standard Bulk Pack |
|---|---|---|
| I/O Shield | 1 | 10 |
| SATA 6Gbps Cable | 4 | 40 |
| Support DVD | 1 | 10 |
| Motherboard | 1 | 10 |

If any of the above items is damaged or missing, contact your retailer.

## 1.3 Serial number label

Before requesting support from the ASUS Technical Support team, you must take note of the motherboard's serial number containing 12 characters xxS2xxxxxxxx shown in the figure below. With the correct serial number of the product, ASUS Technical Support team members can then offer a quicker and satisfying solution to your problems.

# Hardware Information

2

This chapter lists the hardware setup procedures that you have to perform when installing system components. It includes description of the jumpers and connectors on the motherboard.

# 2.1 Before you proceed

Take note of the following precautions before you install any motherboard component or change any motherboard settings.

- Unplug the power cord from the wall socket before touching any component.
- Use a grounded wrist strap or touch a safely grounded object or a metal object, such as the power supply case, before handling components to avoid damaging them due to static electricity.
- Hold components by the edges to avoid touching the ICs on them.
- Whenever you uninstall any component, place it on a grounded antistatic pad or in the bag that came with the component.
- Before you install or remove any component, ensure that the power supply is switched off or the power cord is detached from the power supply. Failure to do so may cause severe damage to the motherboard, peripherals, and/or components.

## 2.2 Motherboard overview

Before you install the motherboard, study the configuration of your chassis to ensure that the motherboard fits into it.

To optimize the features of your motherboard, we highly recommend that you install it in an ATX 2.2 compliant chassis.

> Ensure to unplug the chassis power cord before installing or removing the motherboard. Failure to do so can cause you physical injury and damage motherboard components!

### 2.2.1 Placement direction

When installing the motherboard, ensure that you place it into the chassis in the correct orientation. The edge with external ports goes to the rear part of the chassis as indicated in the image below.

### 2.2.2 Screw holes

Place nine (9) screws into the holes indicated by circles to secure the motherboard to the chassis.

> DO NOT overtighten the screws! Doing so can damage the motherboard.

**Place this side towards the rear of the chassis**

KRPA-U16

## 2.2.3    Motherboard layout

## Layout contents

# 2.3 Central Processing Unit (CPU)

The motherboard comes with a surface mount Socket SP3 designed for the AMD EPYC™ 7002 Series.

⚠️ • Upon purchase of the motherboard, ensure that the PnP cap is on the socket and the socket contacts are not bent. Contact your retailer immediately if the PnP cap is missing, or if you see any damage to the PnP cap/socket contacts/motherboard components. ASUS will shoulder the cost of repair only if the damage is shipment/transit-related.

• Keep the cap after installing the motherboard. ASUS will process Return Merchandise Authorization (RMA) requests only if the motherboard comes with the cap on the Socket SP3.

• The product warranty does not cover damage to the socket contacts resulting from incorrect CPU installation/removal, or misplacement/loss/incorrect removal of the PnP cap.

## 2.3.1 Installing the CPU

To install the CPU:

1. Locate the CPU socket on the motherboard.
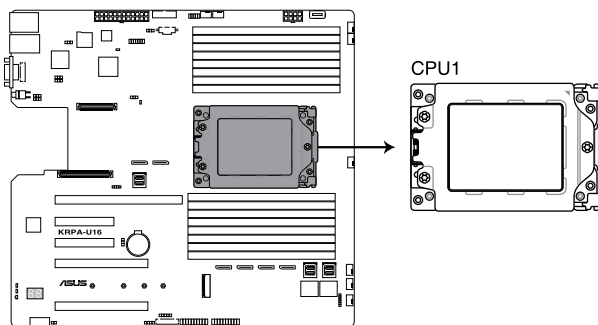


**KRPA-U16 CPU SP3 Socket**

2.  Loosen each screw one by one in the sequence shown on the socket to open the load plate.
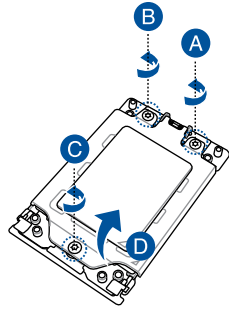


3.  Slightly lift open the rail frame.

**Load plate**

**Rail frame**
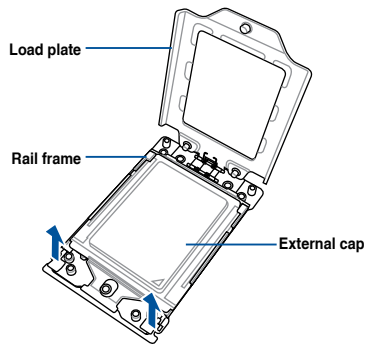
**External cap**



4.  Slide the external cap out of the rail frame.

**External cap**
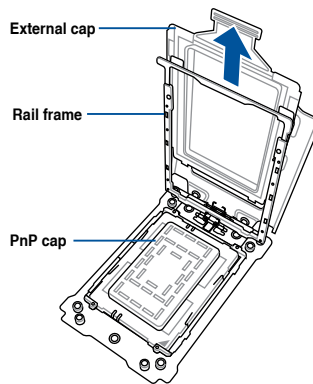
**Rail frame**

**PnP cap**

5. Slide the carrier frame with CPU into the rail frame, then remove the PnP cap.

The carrier frame with CPU fits in only one correct orientation. DO NOT force the carrier frame with CPU into the rail frame.

**Carrier frame with CPU**

**Rail frame**

**PnP cap**

A

B
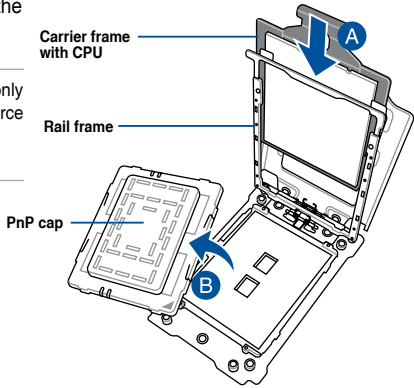
6. Gently push the rail frame just enough to let it sit on top of the CPU socket.

**Carrier frame with CPU**
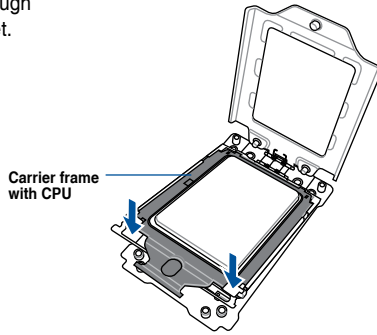
7. Close the load plate just enough to let it sit on top of the CPU, then secure each screw one by one in the sequence shown on the socket to completely secure the load plate.

The load plate screws are T20 models. A torque value of 14.0±1.0 inch-lbf is recommended.

B

C

A
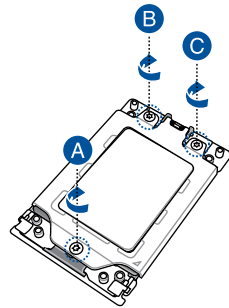
8. Twist each of the four screws with a screwdriver just enough to attach the heatsink to the motherboard. When the four screws are attached, tighten them one by one in a diagonal sequence to complete the installation.

The heatsink screws are T20 models. A torque value of 12 inch-lbf is recommended.
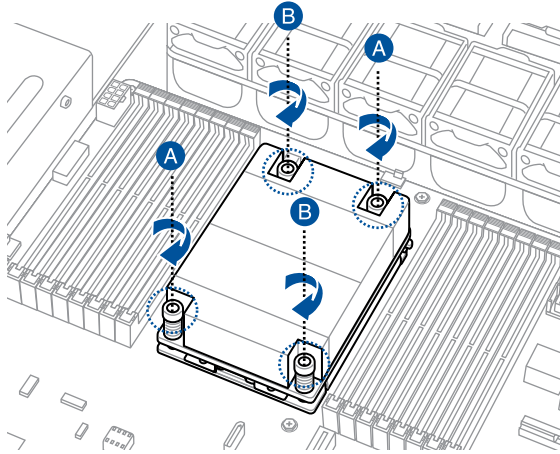
# 2.4 System memory

## 2.4.1 Overview

The motherboard comes with sixteen (16) Double Data Rate 4 (DDR4) Dual Inline Memory Modules (DIMM) sockets.

The figure illustrates the location of the DDR4 DIMM sockets:
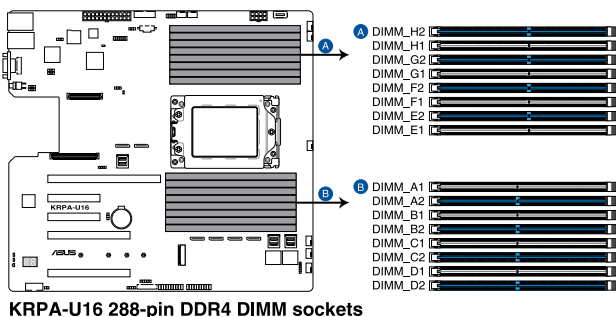


**KRPA-U16 288-pin DDR4 DIMM sockets**

## 2.4.2 Memory Configurations

You may install 32GB, 16GB, 8GB, 4GB RDIMM, 64GB, 32GB LRDIMM, or 128GB, 64GB LRDIMM 3DS into the DIMM sockets using the memory configurations in this section.

| Memory configurations | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DIMM | | | | | | | | | | | | | | | |
| | A1 | A2 | B1 | B2 | C1 | C2 | D1 | D2 | E1 | E2 | F1 | F2 | G1 | G2 | H1 | H2 |
| **1 DIMM** | | | | | | ✓ | | | | | | | | | | |
| **2 DIMMs** | | | | | | ✓ | | ✓ | | | | | | | | |
| **4 DIMMs** | | | | | | ✓ | | ✓ | | | | | | ✓ | | ✓ |
| **8 DIMMs** | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ | | ✓ |
| **10 DIMMs** | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | ✓ |
| **12 DIMMs** | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | | ✓ |
| **14 DIMMs** | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ |
| **16 DIMMs** | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

- Always install DIMMs with the same CAS latency. For optimum compatibility, it is recommended that you obtain memory modules from the same vendor.
- Start installing the DIMMs in slots A2.

### 2.4.3    Installing a DIMM on a single clip DIMM socket

> Ensure to unplug the power supply before adding or removing DIMMs or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

1. Unlock a DIMM socket by pressing the retaining clip outward.

2. Align a DIMM on the socket such that the notch on the DIMM matches the DIMM slot key on the socket.

**DIMM notch**

**DIMM slot key**        **Unlocked retaining clip**
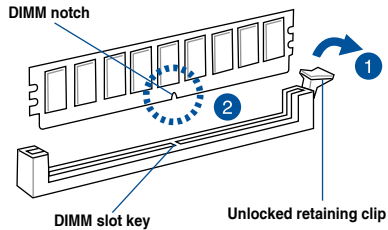
> A DIMM is keyed with a notch so that it fits in only one direction. DO NOT force a DIMM into a socket in the wrong direction to avoid damaging the DIMM.

3. Hold the DIMM by both of its ends then insert the DIMM vertically into the socket. Apply force to both ends of the DIMM simultaneously until the retaining clip snaps back into place and the DIMM cannot be pushed in any further to ensure proper sitting of the DIMM.

**Locked Retaining Clip**
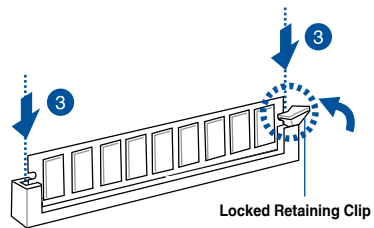
> Always insert the DIMM into the socket vertically to prevent DIMM notch damage.

### Removing a DIMM from a single clip DIMM socket

1. Press the retaining clip outward to unlock the DIMM.

2. Remove the DIMM from the socket.
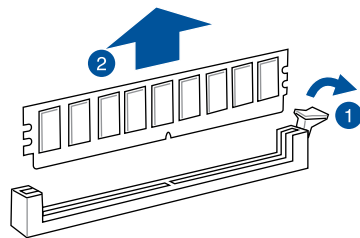
> Support the DIMM lightly with your fingers when pressing the retaining clips. The DIMM might get damaged when it flips out with extra force.

## 2.5　Expansion slots

In the future, you may need to install expansion cards. The following subsections describe the slots and the expansion cards that they support.

⚠️ Ensure to unplug the power cord before adding or removing expansion cards. Failure to do so may cause you physical injury and damage motherboard components.

### 2.5.1　Installing an expansion card

To install an expansion card:

1. Before installing the expansion card, read the documentation that came with it and make the necessary hardware settings for the card.

2. Remove the system unit cover (if your motherboard is already installed in a chassis).

3. Remove the bracket opposite the slot that you intend to use. Keep the screw for later use.

4. Align the card connector with the slot and press firmly until the card is completely seated on the slot.

5. Secure the card to the chassis with the screw you removed earlier.

6. Replace the system cover.

### 2.5.2　Configuring an expansion card

After installing the expansion card, configure it by adjusting the software settings.

1. Turn on the system and change the necessary BIOS settings, if any. See Chapter 4 for information on BIOS setup.

2. Assign an IRQ to the card. Refer to the tables on the next page.

3. Install the software drivers for the expansion card.

✎ When using PCI cards on shared slots, ensure that the drivers support "Share IRQ" or that the cards do not need IRQ assignments. Otherwise, conflicts will arise between the two PCI groups, making the system unstable and the card inoperable.

## 2.5.3    Interrupt assignments

**Standard Interrupt assignments**

| IRQ | Priority | Standard function |
|---|---|---|
| 0 | 1 | System Timer |
| 1 | 2 | Keyboard Controller |
| 2 | - | Programmable Interrupt |
| 3* | | |
| 4* | 12 | Communications Port (COM1) |
| 5* | 13 | -- |
| 6 | | |
| 7* | 15 | -- |
| 8 | 3 | System CMOS/Real Time Clock |
| 9* | 4 | ACPI Mode when used |
| 10* | 5 | IRQ Holder for PCI Steering |
| 11* | 6 | IRQ Holder for PCI Steering |
| 12* | 7 | PS/2 Compatible Mouse Port |
| 13 | 8 | Numeric Data Processor |
| 14* | | |
| 15* | | |

* These IRQs are usually available for ISA or PCI devices.
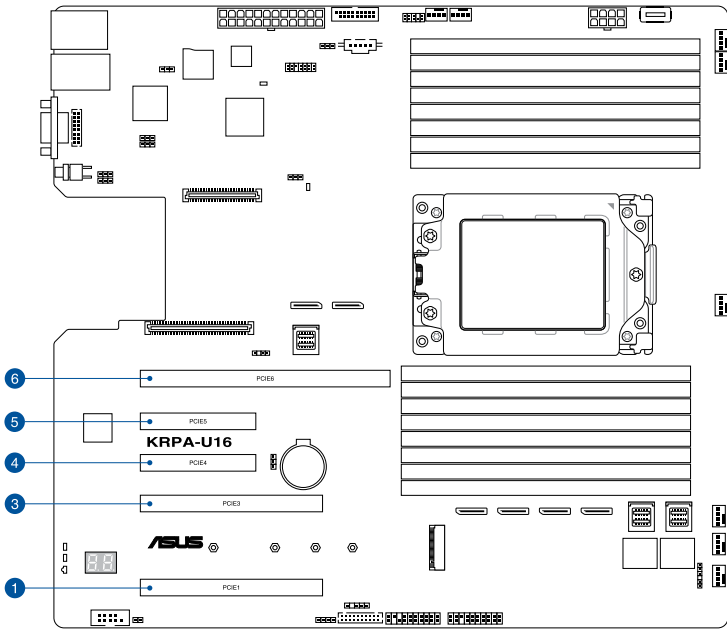
| No.(Slot location) | Short Description |
|---|---|
| PCIE6 | PCIe 4.0 x24 (x16 link + x8 link) HL |
| PCIE5 | PCIe 4.0 x8 (x8 link) HL |
| PCIE4 | PCIe 3.0x 8 (x8 link q-switch from slot-2) HL |
| PCIE3 | PCIe 3.0 x16 (x16 link, if Slot3 is occupied switch to x8 link) FL |
| PCIE1 | PCIe 3.0 x16 (x16 link) FL |

# 2.6    Jumpers

1.    **Clear RTC RAM (3-pin CLRTC1)**

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS which include system setup information such as system passwords.

To erase the RTC RAM:

1.    Turn OFF the computer and unplug the power cord.

2.    Move the jumper cap from the default pins 1–2 to pins 2–3. Keep the cap on pins 2–3 for about 5 to 10 seconds, then move the cap back to pins 1–2.

3.    Plug the power cord and turn ON the computer.

4.    Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

DO NOT remove the cap on CLRTC jumper default position except when clearing the RTC RAM. Removing the cap will cause system boot failure!

If the steps above do not help, remove the onboard battery and move the jumper again to clear the CMOS RTC RAM data. After the CMOS clearance, reinstall the battery.

CLRTC1

2
1
Normal
(Default)

3
2
Clear CMOS

**KRPA-U16 Clear RTC RAM**
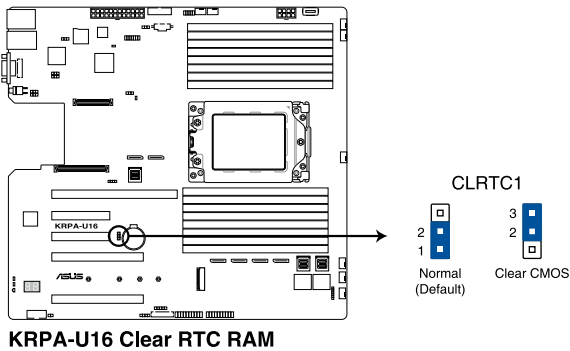
2. **VGA controller setting (3-pin VGA_SW1)**

   This jumper allows you to enable or disable the onboard VGA controller. Set to pins 1–2 to activate the VGA feature.

VGA_SW1

1  2          2  3

Enable        Disable
(Default)
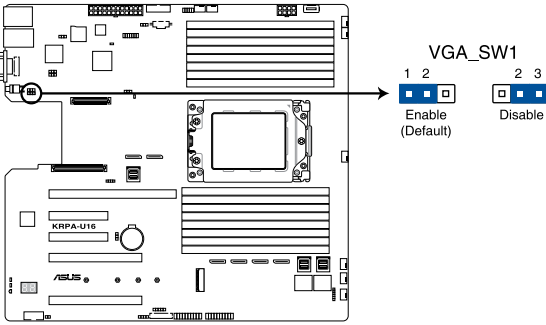
**KRPA-U16 VGA controller setting**

3. **LAN controller settings (3-pin LAN_SW1-2)**

   These jumpers allow you to enable or disable the onboard LAN_SW1 or LAN_SW2. Set to pins 1-2 to activate the Gigabit LAN feature.

1  2          2  3

LAN_SW2
LAN_SW1

Enable        Disable
(Default)
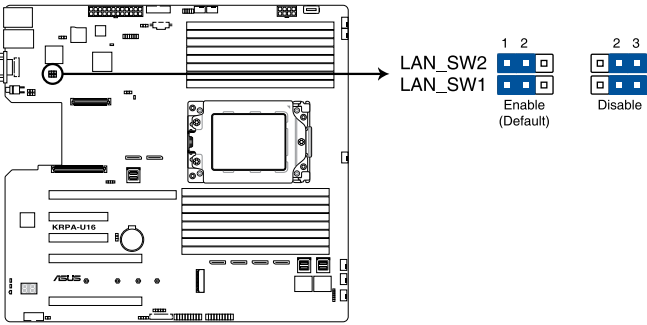
**KRPA-U16 LAN controller setting**

4. **BMC Setting (3-pin BMC_EN1)**

   This jumper allows you to enable or disable the Baseboard Management Controller (ASMB9).
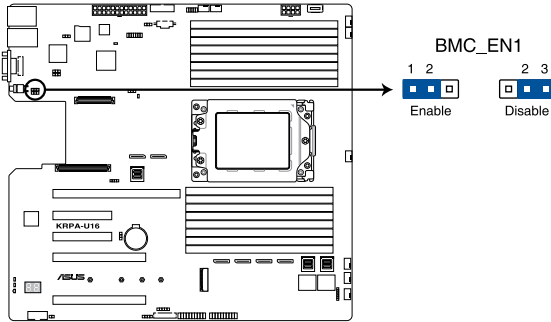


**KRPA-U16 BMC setting**

5. **DMLAN setting (3-pin DM_IP_EN1)**

   This jumper allows you to select the DMLAN setting. Set to pins 2-3 to force the DMLAN IP to static mode (IP=10.10.10.10, submask=255.255.255.0).
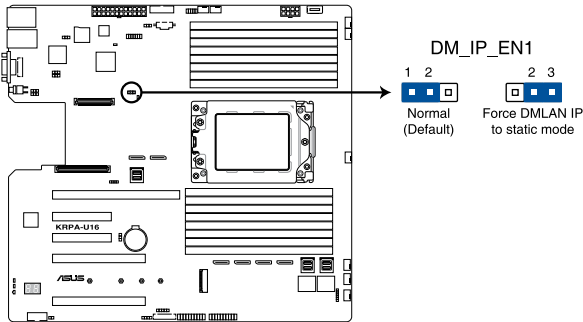


**KRPA-U16 DMLAN setting**

**6.    LANNCSI setting (3-pin LANNCSI_SEL1)**

This jumper allows you to select which LAN NCSI to function.

LANNCSI_SEL1

I350 for share LAN
(Default)

OCP card for share LAN
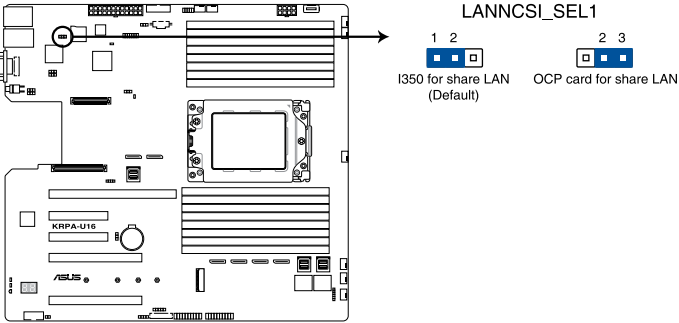
**KRPA-U16 LANNCSI setting**

**7.    Smart Ride Through (SmaRT) setting (3-pin SMART_PSU1)**

This jumper allows you to enable or disable the Smart Ride Through (SmaRT) function. This feature is enabled by default. Set to pins 2-3 to disable it. When enabled, SmaRT allows uninterrupted operation of the system during an AC loss event.

SMART_PSU1

Enable

Disable
(Default)
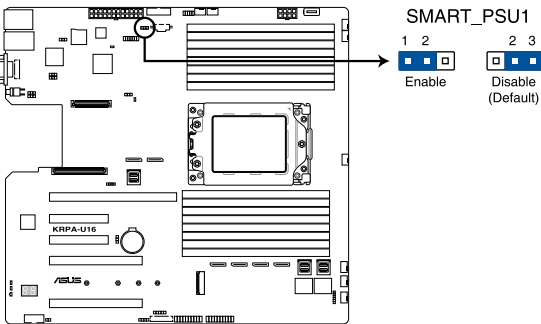
**KRPA-U16 Smart Ride Through setting**

# 2.7 Onboard LEDs

1. **Standby Power LED (SBPWR1)**

   The motherboard comes with a standby power LED. The green LED lights up to indicate that the system is ON, in sleep mode, or in soft-off mode. This is a reminder that you should shut down the system and unplug the power cable before removing or plugging in any motherboard component. The illustration below shows the location of the onboard LED.

   SBPWR1

   ON          OFF
   Standby Power   Powered Off
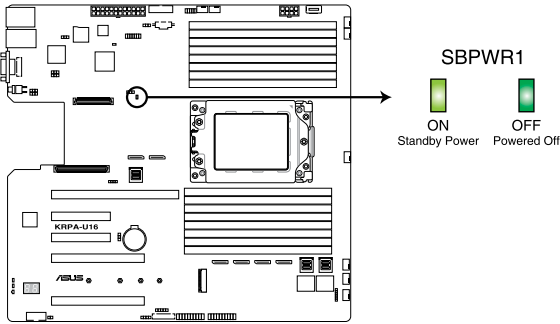
   **KRPA-U16 Standby Power LED**

2. **BMC LED (BMCLED1)**

   The BMC LED lights up to indicate that the on-board BMC is functional.
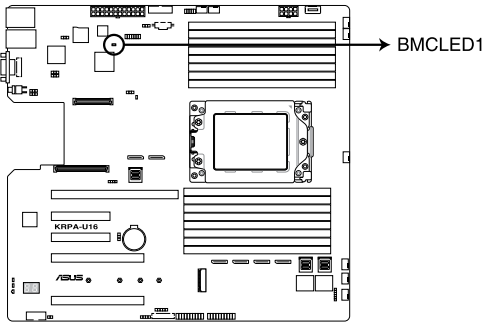
   BMCLED1

   **KRPA-U16 BMC LED**

   This LED functions only when you enable ASUS ASMB9.

3.    **Location LED (LOCLED1)**

   This onboard LED lights up when the Location button on the server is pressed or when triggered by a system management software. The Location LED helps visually locate and quickly identify the server in error on a server rack.



→ LOCLED1
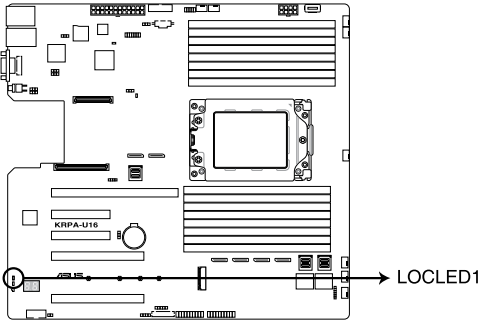
**KRPA-U16 Location LED**

4.    **Message LED (MESLED1)**

   This onboard LED lights up to red when there is a BMC event log is generated.
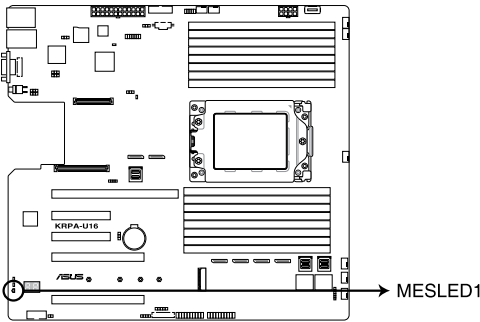


→ MESLED1

**KRPA-U16 MESLED**

5.    **Hard disk activity LED (HDDLED1)**

This LED is for the storage devices connected to the onboard SATA, or SATA/SAS add-on card. The read or write activities of any device connected to the onboard SATA, or SATA/SAS add-on card causes the rear panel LED to light up.
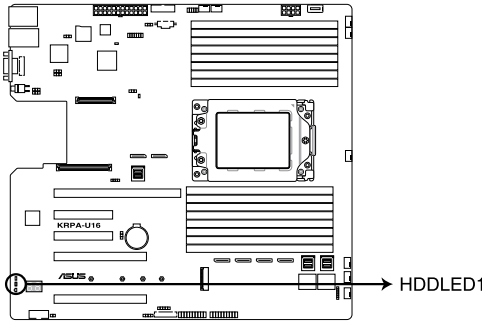


**KRPA-U16 Storage device activity LED**

6.    **Q-Code LEDs**

The Q-Code LED design provides you with a 2-digit error code that displays the system status. Refer to the Q-Code table on the next page for details.
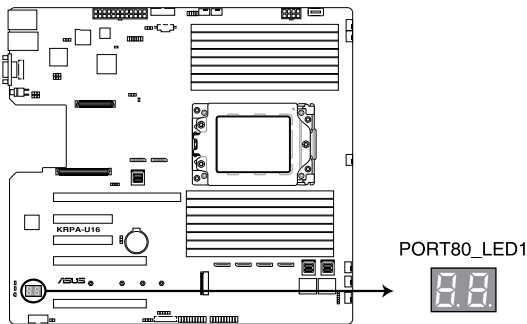


**KRPA-U16 Q-Code LED**

> •  The Q-Code LEDs provide the most probable cause of an error code as a starting point for troubleshooting. The actual cause may vary from case to case.
>
> •  Please refer to the Q-Code table in the **Appendix** section for more details.

## 2.8 Connectors

### 2.8.1 Rear panel connectors
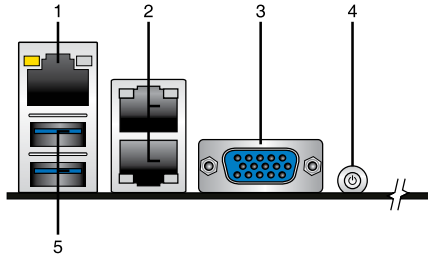


1.  **RJ-45 port for iKVM.** This RJ-45 port functions only when you install ASMB9 management card.

2.  **RJ-45 port for LAN 1 and LAN 2.** This port allows Gigabit connection to a Local Area Network (LAN) through a network hub. Refer to the table below for the LAN port LED indications.

3.  **Video Graphics Adapter port.** This port is for a VGA monitor or other VGA-compatible devices.

4.  **Power-on Button.** Press this button to turn on the system.

5.  **USB 3.2 Gen 1 ports 1 and 2.** These two 4-pin USB ports are available for connecting USB 3.2 Gen 1 devices.

#### LAN port LED indications



| Activity/Link LED | | Speed LED | |
|---|---|---|---|
| Status | Description | Status | Description |
| OFF | No link | OFF | 10 Mbps connection |
| GREEN | Linked | ORANGE | 100 Mbps connection |
| BLINKING | Data activity | GREEN | 1 Gbps connection |
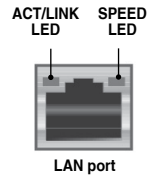
## 2.8.2 Internal connectors

1.  **Serial ATA connectors (7-pin SATA1-4)**

    These connectors, controlled by AMD integrated SATA controller, are for the Serial ATA signal cables for Serial ATA drives (SATA 1 connector is used for the optical drive by default).
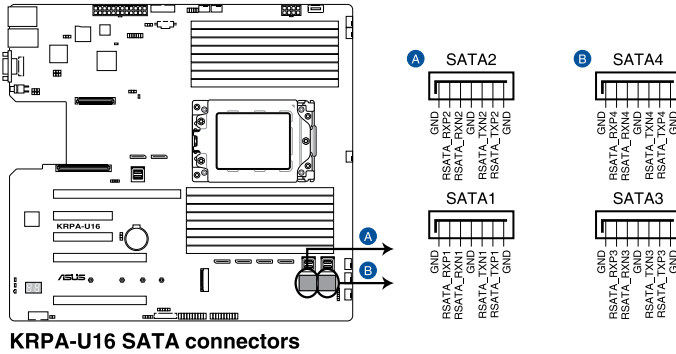


**KRPA-U16 SATA connectors**

> The actual data transfer rate depends on the speed of Serial ATA hard disks installed.

2.  **Power Supply SMBus connector (5-pin PSUSMB1)**

    This connector allows you to connect SMBus (System Management Bus) to the PSU (power supply unit) to read PSU information. Devices communicate with an SMBus host and/or other SMBus devices using the SMBus interface.
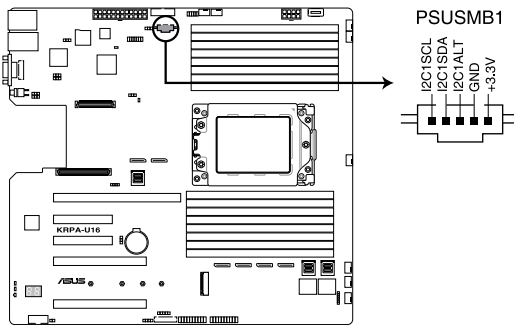


**KRPA-U16 Power supply SMBus connector**

> This connector functions only when you enable ASUS ASMB9.

### 3. USB 3.0 connector (20-1 pin USB3_34; 4-pin Type-A USB3_5)

The 20-1 pin connector allows you to connect a USB 3.0 module for additional USB 3.0 front or rear panel ports. The 4-pin USB (Universal Serial Bus) Type-A port is available for connecting USB 3.0 devices.
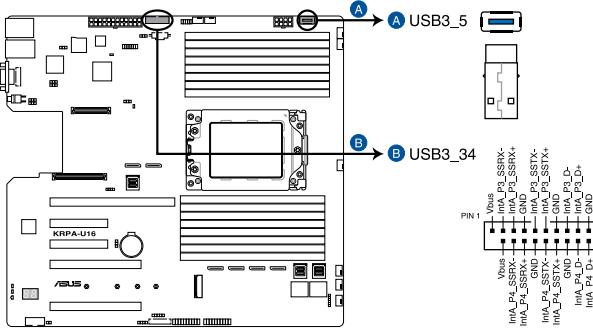


**KRPA-U16 USB 3.0 connectors**

### 4. VPP_I2C1 connector (10-1 pin VPP_I2C1)

This connector is used for the sensor readings.
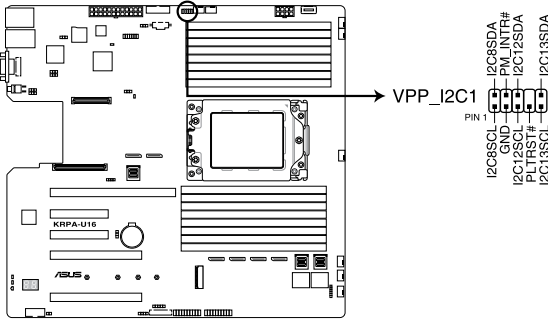


**KRPA-U16 VPP_I2C1 connector**

**5.    Front and rear fan connectors (4-pin FRNT_FAN1-6, REAR_FAN1-2)**

The fan connectors support cooling fans. Connect the fan cables to the fan connectors on the motherboard, ensuring that the black wire of each cable matches the ground pin of the connector.

> • DO NOT forget to connect the fan cables to the fan connectors. Insufficient air flow inside the system may damage the motherboard components.
>
> • These are not jumpers! DO NOT place jumper caps on the fan connectors!
>
> • All fans feature the ASUS Smart Fan technology.



**KRPA-U16 FAN connectors**
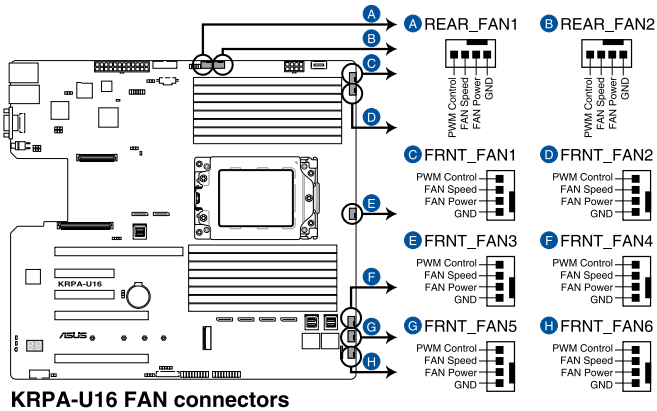
**6.    LAN Activity LED connector (5-1 pin LAN34_LED1)**

These leads are for 10G LAN activity LEDs on the front panel. Connect the LAN LED cable to the backplane for LAN activity indication.



**KRPA-U16 LAN Activity LED connector**
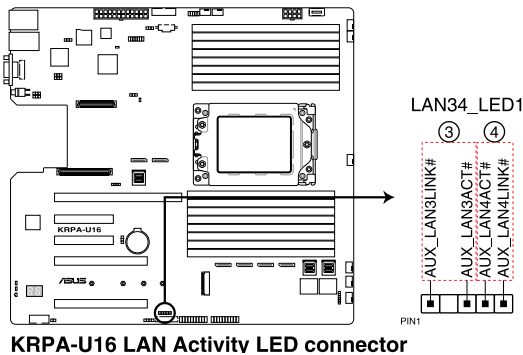
## 7. Trusted Platform Module connector (14-1 pin TPM1)

This connector supports a Trusted Platform Module (TPM) system, which can securely store keys, digital certificates, passwords, and data. A TPM system also helps enhance network security, protects digital identities, and ensures platform integrity.
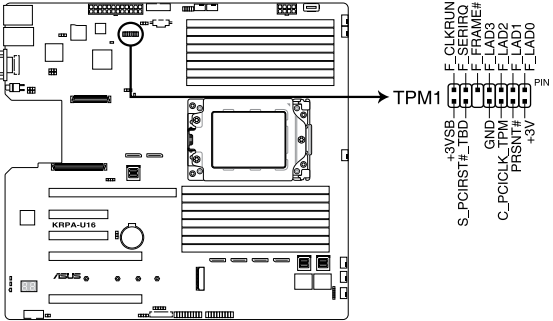


**KRPA-U16 Trusted Platform Module connector**

## 8. ATX power connectors (24-pin EATXPWR1, 8-pin EATX12V1)

These connectors are for the ATX power supply plugs. The power supply plugs are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.

- DO NOT forget to connect the 24-pin and the 8-pin power plugs; otherwise, the system will not boot up.

- Use of a power supply unit (PSU) with a higher power output is recommended when configuring a system with more power-consuming devices. The system may become unstable or may not boot up if the power is inadequate.

- This motherboard supports ATX2.0 PSU or later version.

- Ensure that your PSU can provide at least the minimum power required by your system.
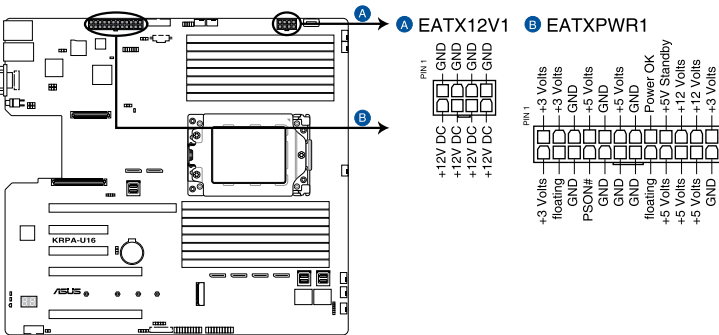


**KRPA-U16 ATX power connectors**

9. **System panel connector (20-1 pin PANEL1)**

This connector supports several chassis-mounted functions.
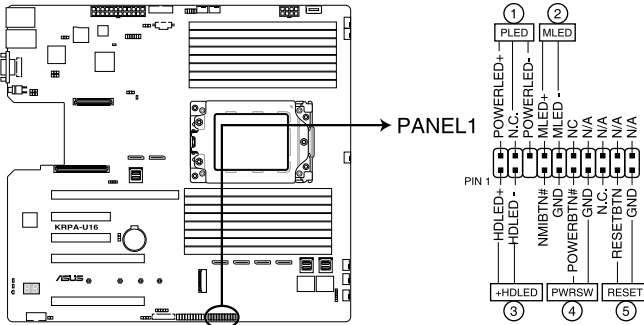


**KRPA-U16 System panel connector**

1. **System power LED (3-pin PLED)**

   This 3-pin connector is for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

2. **Message LED (2-pin MLED)**

   This 2-pin connector is for the message LED cable that connects to the front message LED. The message LED is controlled by the BMC to indicate an abnormal event occurrence.

3. **Hard disk drive activity LED (2-pin HDLED)**

   This 2-pin connector is for the HDD Activity LED. Connect the HDD Activity LED cable to this connector. The LED lights up or flashes when data is read from or written to the HDD.

4. **ATX power button/soft-off button (2-pin PWRSW)**

   This connector is for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing the power switch for more than four seconds while the system is ON turns the system OFF.

5. **Reset button (2-pin RESET)**

   This 2-pin connector is for the chassis-mounted reset button for system reboot without turning off the system power.

10. **Auxiliary panel connector (20-2 pin AUX_PANEL1, 20-pin AUX_PANEL2)**

This connector is for additional front panel features including front panel SMB, locator LED and switch, chassis intrusion, and LAN LEDs.



**KRPA-U16
Auxiliary panel connectors**
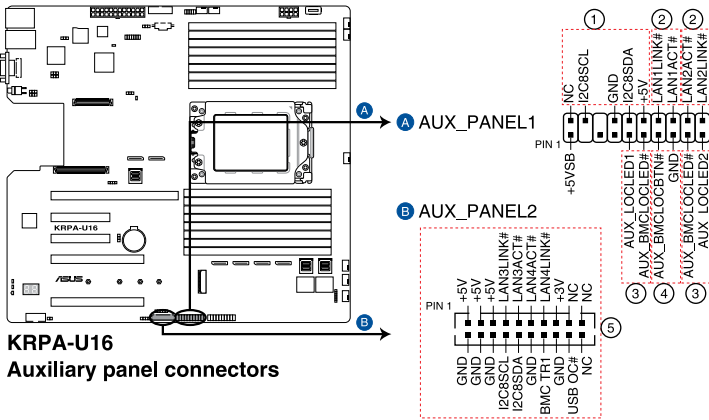
1. **Front panel SMB (6-1 pin FPSMB)**

   These leads connect the front panel SMBus cable.

2. **LAN activity LED (2-pin LAN1_LED, LAN2_LED)**

   These leads are for the Gigabit LAN activity LEDs on the front panel.

3. **Locator LED (2-pin LOCATORLED1, LOCATORLED2)**

   These leads are for the locator LED1 and LED2 on the front panel. Connect the Locator LED cables to these 2-pin connector. The LEDs will light up when the Locator button is pressed.

4. **Locator Button/Switch (2-pin LOCATORBTN)**

   These leads are for the locator button on the front panel. This button queries the state of the system locator.

5. **LAN activity LED and USB port (2-pin LAN3_LED, LAN4_LED, USB ports)**

   These leads are for the Gigabit LAN activity LEDs and USB ports on the front panel.

### 11. VGA connector (10-1 pin VGA_HDR1)

This connector supports the VGA High Dynamic-Range interface.

**VGA_HDR1**

| | |
|---|---|
| DDC_CLK | |
| H_SYNC | V_SYNC |
| | DDC_DATA |
| +5V | GND |
| GND | GND |
| GND | GND |
| Blue | |
| Red | Green |

PIN 1
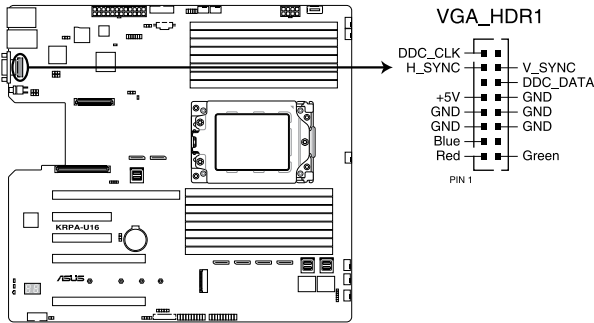
**KRPA-U16 Internal VGA connector**

### 12. Hard disk activity LED connector (4-pin HDLED1)

This LED connector is for the storage add-on card cable connected to the SATA or SAS add-on card. The read or write activities of any device connected to the SATA or SAS add-on card causes the front panel LED to light up.

**HDLED1**

NC    ADD_IN_CARD-    ADD_IN_CARD-    NC
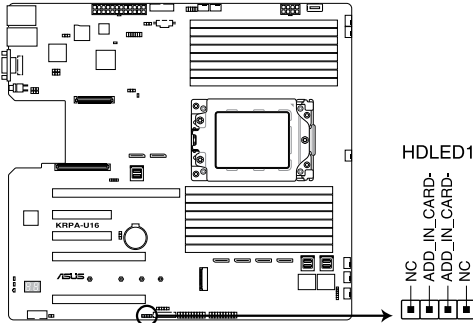
**KRPA-U16 Storage device activity LED connector**

### 13. Chassis Intrusion connectors (2-pin INTRUSION)

This lead is for the intrusion detection feature for chassis with intrusion sensor or microswitch. When you remove any chassis component, the sensor triggers and sends a high level signal to these leads to record a chassis intrusion event. The default setting is short CASEOPEN and GND pin by jumper cap to disable the function.
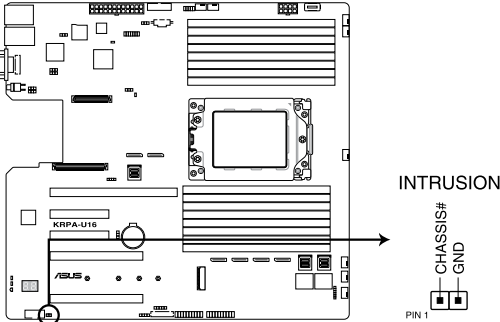


**KRPA-U16 Chassis Intrusion connector**

### 14. OCuLink connectors (MPCIE_HD1-6)

Connects the PCIE signal to the NVME port on the backplane.
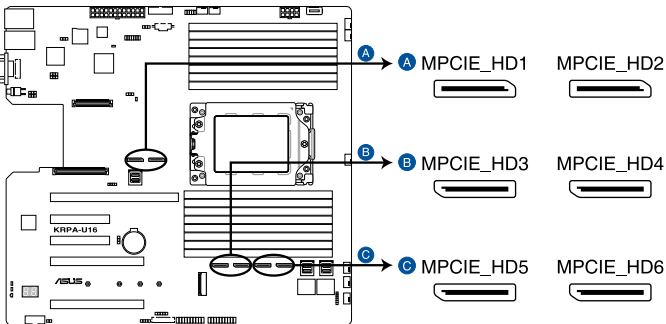


**KRPA-U16 OCUPCIE connectors**

### 15. M.2 (NGFF) connectors (NGFF1)

This connector allows you to install M.2 devices.
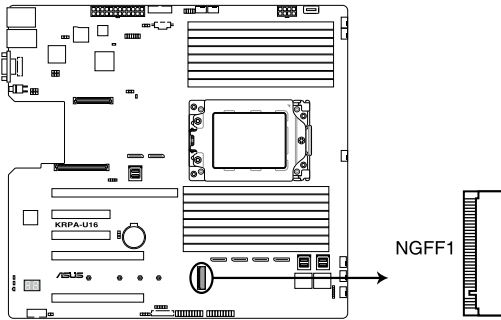


**KRPA-U16 M.2 (NGFF) connector**

This connector supports type 2242/2260/2280/22110 devices on both PCI-E and SATA interface.

The M.2 (NGFF) device is purchased separately.

### 16. Mezzanine PCIE card connectors (MEZZPCIE1-2)

The Mezzanine PCIE connector supports Open Compute Project (OCP) cards.
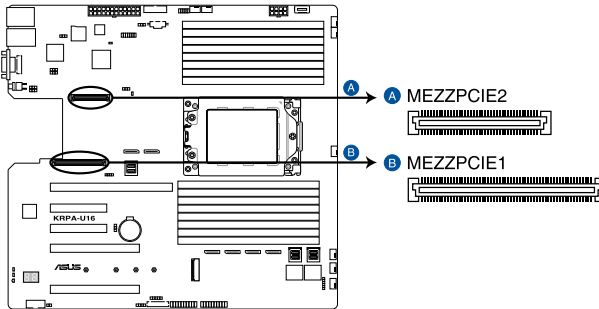


**KRPA-U16 Mezzanine PCIE card connectors**

**17. OCP LAN Activity LED connector (4-1 pin OCP_LED1)**

OCP LAN LED connector supports OCP LAN card Active LED.
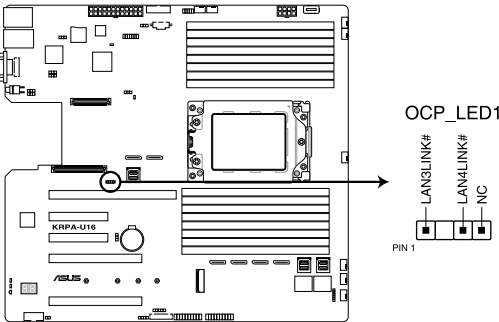


**KRPA-U16 OCP LAN Activity LED connector**

**18. Micro SD card slot (MSD1)**

Your motherboard supports SD Memory Card v2.00 (SDHC) / v3.00 (SDXC).
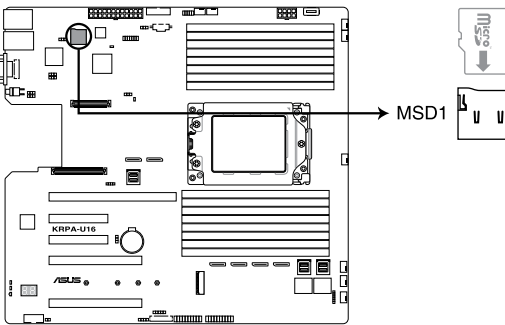


**KRPA-U16 Micro SD card slot**

> Disconnect all power (including redundant PSUs) from the existing system before you add or remove a Memory Card, then reboot the system to access the Memory Card.

> • This Micro SD card slot functions only when you enable ASUS ASMB9.
>
> • Some memory cards may not be compatible with your motherboard. Ensure that you use only compatible memory cards to prevent loss of data, damage to your device, or memory card, or both.

### 19. Mini-SAS HD connectors (ISATA1-3)

This motherboard comes with mini Serial Attached SCSI (SAS) HD connectors, the storage technology that supports Serial ATA. Each connector supports up to four devices.
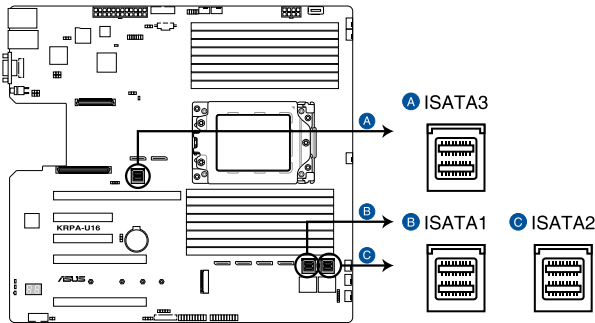
**KRPA-U16 Mini-SAS HD connectors**

### 20. Serial General Purpose Input/Output connector (6-1 pin SATA_SGPIO1)

The Serial General Purpose Input/Output (SGPIO) connector allows you to connect the Intel Rapid Storage Technology Enterprise SGPIO interface. The SGPIO interface controls the LED pattern generation, device information, and general purpose data.
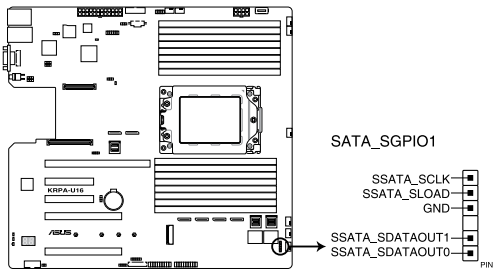
**KRPA-U16 SATA_SGPIO1 connector**

**21. Serial port connector (10-1 pin COM1)**

This connector is for the serial COM port. Connect the serial port module cable to one of these connectors, then install the module to a slot opening at the back of the system chassis.

**KRPA-U16 Serial port connector**
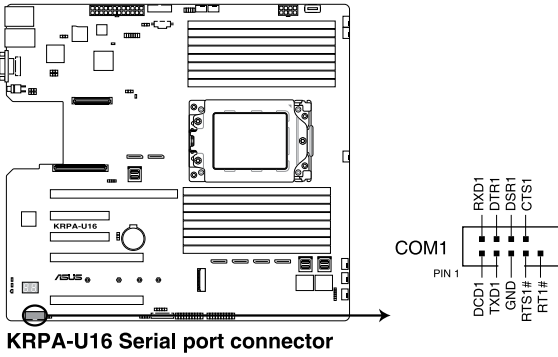
The COM module is purchased separately.

# Powering Up

3

This chapter describes the power up sequence, and ways of shutting down the system.

# 3.1 Starting up for the first time

1. After making all the connections, replace the system case cover.

2. Be sure that all switches are off.

3. Connect the power cord to the power connector at the back of the system chassis.

4. Connect the power cord to a power outlet that is equipped with a surge protector.

5. Turn on the devices in the following order:

   a. Monitor

   b. External storage devices (starting with the last device on the chain)

   c. System power

6. After applying power, the system power LED on the system front panel case lights up. For systems with ATX power supplies, the system LED lights up when you press the ATX power button. If your monitor complies with "green" standards or if it has a "power standby" feature, the monitor LED may light up or switch between orange and green after the system LED turns on.

   The system then runs the power-on self-test or POST and additional messages appear on the screen. If you do not see anything within 30 seconds from the time you turned on the power, the system may have failed a power-on test. Check the jumper settings and connections or call your retailer for assistance.

7. At power on, hold down the <Del> key to enter the BIOS Setup. Follow the instructions in Chapter 4.

## 3.2 Powering off the computer

### 3.2.1 Using the OS shut down function

**Using Windows® Server 2012 R2:**

1. Press <Ctrl>+<Alt>+<Del>.

2. Click on the Power icon on the lower right side of the screen.

3. Select **Shut down**.

4. In the *Shutdown Event Tracker*, select the **Other (Planned)** option in the selection list. Otherwise, select the option that best describes why you want to shut down the computer.

5. Click **Continue**.

**Using Windows® Server 2016:**

1. Press <Alt>+<F4>.

2. In the *What do you want the computer to do?*, select **Shut down**.

3. In the *Shutdown Event Tracker*, select the **Other (Planned)** option in the selection list. Otherwise, select the option that best describes why you want to shut down the computer.

4. Click **OK**.

### 3.2.2 Using the dual function power switch

While the system is ON, press the power switch for less than four seconds to put the system to sleep mode or to soft-off mode, depending on the BIOS setting.

Pressing the power switch for more than four seconds lets the system enter the soft-off mode regardless of the BIOS setting.

# BIOS Setup

4

This chapter tells how to change the system settings through the BIOS Setup menus. Detailed descriptions of the BIOS parameters are also provided.

# 4.1 Managing and updating your BIOS

The following utilities allow you to manage and update the motherboard Basic Input/Output System (BIOS) setup:

1.  **ASUS CrashFree BIOS 3**

    To recover the BIOS using a bootable USB flash disk drive when the BIOS file fails or gets corrupted.

2.  **ASUS EzFlash**

    Updates the BIOS using a USB flash disk.

3.  **BUPDATER**

    Updates the BIOS in DOS mode using a bootable USB flash disk drive.

Refer to the corresponding sections for details on these utilities.

> Save a copy of the original motherboard BIOS file to a bootable USB flash disk drive in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the BUPDATER utility.

## 4.1.1 ASUS CrashFree BIOS 3 utility

The ASUS CrashFree BIOS 3 is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can update a corrupted BIOS file using a USB flash drive that contains the updated BIOS file.

> Prepare a USB flash drive containing the updated motherboard BIOS before using this utility.

**Recovering the BIOS from a USB flash drive**
To recover the BIOS from a USB flash drive:

1.  Insert the USB flash drive with the original or updated BIOS file to one USB port on the system.

2.  The utility will automatically recover the BIOS. It resets the system when the BIOS recovery finished.

> DO NOT shut down or reset the system while recovering the BIOS! Doing so would cause system boot failure!

> The recovered BIOS may not be the latest BIOS version for this motherboard. Visit the ASUS website at www.asus.com to download the latest BIOS file.

## 4.1.2 ASUS EZ Flash Utility

The ASUS EZ Flash Utility feature allows you to update the BIOS without having to use a DOS-based utility.

> Before you start using this utility, download the latest BIOS from the ASUS website at www.asus.com.

To update the BIOS using EZ Flash Utility:

1. Insert the USB flash disk that contains the latest BIOS file into the USB port.

2. Enter the BIOS setup program. Go to the **Tool** menu then select **ASUS EZ Flash Utility**. Press <Enter>.

```
                    ASUS Tek. EzFlash Utility

       Current Platform                    New Platform
Platform : KRPA-U16               Platform : KRPA-U16
Version :   0201                  Version :   0207
Build Date :12/04/2018            Build Date :01/05/2019

FS0           System Volume Information            <DIR>
              KRPA-U16 BIOS                        <DIR>
              Windows                              <DIR>




[Up/Down/Left/Right]:Switch [Enter]:Choose [q]:Exit

```
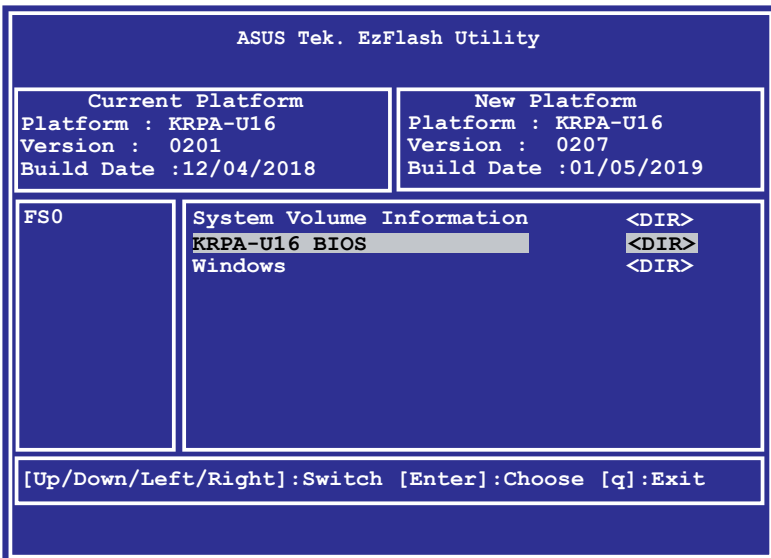
3. Press <Tab> to switch to the **Drive** field.

4. Press the Up/Down arrow keys to find the USB flash disk that contains the latest BIOS, then press <Enter>.

5. Press <Tab> to switch to the **Folder Info** field.

6. Press the Up/Down arrow keys to find the BIOS file, and then press <Enter> to perform the BIOS update process. Reboot the system when the update process is done.

> • This function can support devices such as a USB flash disk with FAT 32/16 format and single partition only.
>
> • DO NOT shut down or reset the system while updating the BIOS to prevent system boot failure!

> Ensure to load the BIOS default settings to ensure system compatibility and stability. Press <F5> and select **Yes** to load the BIOS default settings.

## 4.1.3    BUPDATER utility

> The succeeding BIOS screens are for reference only. The actual BIOS screen displays may not be the same as shown.

The BUPDATER utility allows you to update the BIOS file in the DOS environment using a bootable USB flash disk drive with the updated BIOS file.

### Updating the BIOS file

To update the BIOS file using the BUPDATER utility:

1. Visit the ASUS website at www.asus.com and download the latest BIOS file for the motherboard. Save the BIOS file to a bootable USB flash disk drive.

2. Copy the BUPDATER utility (BUPDATER.exe) from the ASUS support website at https://www.asus.com/support to the bootable USB flash disk drive you created earlier.

3. Boot the system in DOS mode, then at the prompt, type:

   `BUPDATER /i[filename].CAP`

   where [filename] is the latest or the original BIOS file on the bootable USB flash disk drive, then press <Enter>.

   ```
   A:\>BUPDATER /i[file name].CAP
   ```

4.    The utility verifies the file, then starts updating the BIOS file.
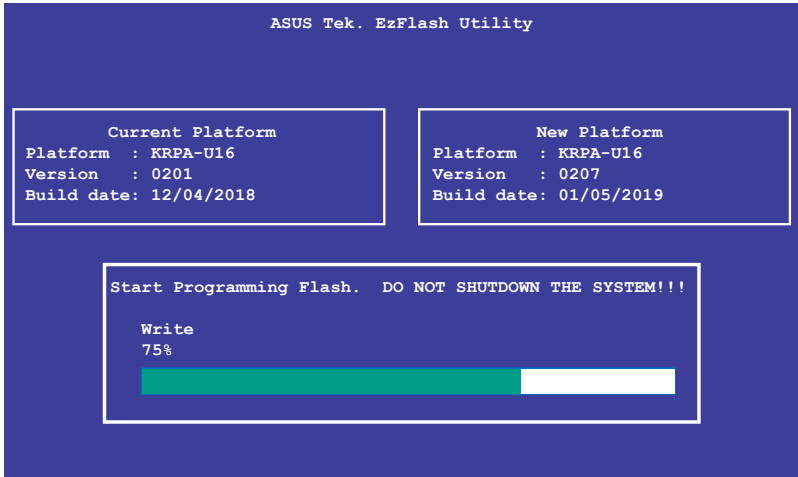
```
                     ASUS Tek. EzFlash Utility



          Current Platform                      New Platform
Platform  : KRPA-U16                 Platform  : KRPA-U16
Version   : 0201                     Version   : 0207
Build date: 12/04/2018               Build date: 01/05/2019


        Start Programming Flash.   DO NOT SHUTDOWN THE SYSTEM!!!

           Write
           75%
```



DO NOT shut down or reset the system while updating the BIOS to prevent system boot failure!

5.    The utility returns to the DOS prompt after the BIOS update process is completed. Reboot the system from the hard disk drive.

```
The BIOS update is finished! Please restart your system.

C:\>
```
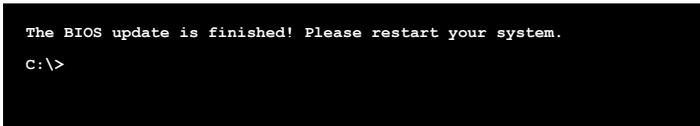
## 4.2 BIOS setup program

This motherboard supports a programmable firmware chip that you can update using the provided utility described in section **5.1 Managing and updating your BIOS**.

Use the BIOS Setup program when you are installing a motherboard, reconfiguring your system, or prompted to "Run Setup." This section explains how to configure your system using this utility.

Even if you are not prompted to use the Setup program, you can change the configuration of your computer in the future. For example, you can enable the security password feature or change the power management settings. This requires you to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM of the firmware chip.

The firmware chip on the motherboard stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program. Press <Del> during the Power-On Self-Test (POST) to enter the Setup utility; otherwise, POST continues with its test routines.

If you wish to enter Setup after POST, restart the system by pressing <Ctrl>+<Alt>+<Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

The Setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various sub-menus and make your selections from the available options using the navigation keys.

---

- The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Press <F5> and select **Yes** to load the BIOS default settings.

- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.

- Visit the ASUS website (www.asus.com) to download the latest BIOS file for this motherboard.

---

## 4.2.1 BIOS menu screen

**Menu items**          **Menu bar**          **Configuration fields**          **General help**

```
              Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
   Main  Advanced  Chipset  Security  Boot  Tool  Save & Exit  AMD CBS  AMD PBS Option        ▶

   BIOS Information                                            Choose the system default
   BIOS Vendor                   American Megatrends          language
   Core Version                  5.14
   Compliancy                    UEFI 2.7; PI 1.6
   Project Version               0302 x64
   Build Date and Time           08/02/2019
   Access Level                  Administrator
   Agesa Version                 v1.0.0.1

   Intel I350 LAN1 MAC           10:7B:44:7A:0A:9B
   Intel I350 LAN2 MAC           10:7B:44:7A:0A:9A

   Memory Information
   Total Memory                  Total Memory: 8192 MB
                                 (DDR4)                      ←→: Select Screen
                                                             ↑↓: Select Item
   System Language               [English]                  Enter: Select
                                                             +/-: Change Opt.
   System Date                   [Wed 08/07/2019]            F1: General Help
   System Time                   [22:30:25]                  F2: Previous Values
                                                             F5: Optimized Defaults
                                                             F10: Save & Reset
                                                             F12: Print Screen
                                                             ESC: Exit

              Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.
```

**Navigation keys**

## 4.2.2 Menu bar

The menu bar on top of the screen has the following main items:

**Main**                    For changing the basic system configuration

**Performance Tuning**      For changing the performance settings

**Advanced**                For changing the advanced system settings

**Chipset**                 For changing the chipset settings

**Security**                For changing the security settings

**Boot**                    For changing the system boot configuration

**Tool**                    For configuring options for special functions

**Save & Exit**             For selecting the exit options

**AMD CBS**                 For configuring AMD CBS settings

**AMD PBS Option**          For configuring AMD PBS settings

**Event Logs**              For changing the event log settings

**Server Mgmt**             For changing the Server Mgmt settings

To select an item on the menu bar, press the right or left arrow key on the keyboard until the desired item is highlighted.

### 4.2.3 Menu items

The highlighted item on the menu bar displays the specific items for that menu. For example, selecting **Main** shows the Main menu items.

The other items (such as Advanced) on the menu bar have their respective menu items.

### 4.2.4 Submenu items

A solid triangle before each item on any menu screen means that the item has a submenu. To display the submenu, select the item then press <Enter>.

### 4.2.5 Navigation keys

At the bottom right corner of a menu screen are the navigation keys for the BIOS setup program. Use the navigation keys to select items in the menu and change the settings.

### 4.2.6 General help

At the top right corner of the menu screen is a brief description of the selected item.

### 4.2.7 Configuration fields

These fields show the values for the menu items. If an item is user-configurable, you can change the value of the field opposite the item. You cannot select an item that is not user-configurable.

A configurable field is enclosed in brackets, and is highlighted when selected. To change the value of a field, select it and press <Enter> to display a list of options.

### 4.2.8 Pop-up window

Select a menu item and press <Enter> to display a pop-up window with the configuration options for that item.

### 4.2.9 Scroll bar

A scroll bar appears on the right side of a menu screen when there are items that do not fit on the screen. Press the Up / Down arrow keys or <Page Up> / <Page Down> keys to display the other items on the screen.

## 4.3 Main menu

When you enter the BIOS Setup program, the Main menu screen appears. The Main menu provides you an overview of the basic system information, and allows you to set the system date, time, language, and security settings.

```
          Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
   Main  Advanced  Chipset  Security  Boot  Tool  Save & Exit  AMD CBS  AMD PBS Option       ▶

   BIOS Information                                            Choose the system default
   BIOS Vendor                    American Megatrends          language
   Core Version                   5.14
   Compliancy                     UEFI 2.7; PI 1.6
   Project Version                0302 x64
   Build Date and Time            08/02/2019
   Access Level                   Administrator
   Agesa Version                  v1.0.0.1

   Intel I350 LAN1 MAC            10:7B:44:7A:0A:9B
   Intel I350 LAN2 MAC            10:7B:44:7A:0A:9A

   Memory Information
   Total Memory                   Total Memory: 8192 MB       →←: Select Screen
                                  (DDR4)                      ↑↓: Select Item
                                                              Enter: Select
   System Language                [English]                   +/-: Change Opt.
                                                              F1: General Help
   System Date                    [Wed 08/07/2019]            F2: Previous Values
   System Time                    [22:30:25]                  F5: Optimized Defaults
                                                              F10: Save & Reset
                                                              F12: Print Screen
                                                              ESC: Exit


          Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.
```

### 4.3.1 System Date [Day xx/xx/xxxx]

Allows you to set the system date.

### 4.3.2 System Time [xx:xx:xx]

Allows you to set the system time.

# 4.4 Performance Tuning menu

The Performance Tuning menu items allow you to change performance related settings for different scenarios.

```
                    Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
        Performance Tuning

 Optimized Performance Setting          [Default]             The following setting shows
 Core Optimizer                         [Disabled]            the recommended BIOS setting
 Engine Boost                           [Disabled]            to optimize for performance
 Overclocking                           [Disabled]            includes those
                                                              performance-related BIOS
```
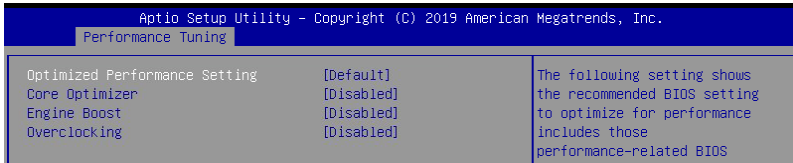
## Optimized Performance Setting [Default]

Allows you to select performance settings for different scenarios.

[Default]         Default settings.

[By Benchmark]    Optimize for different kinds of benchmarks. Select this option, then select a
                  benchmark type from the **>>** list.

[By Workload]     Optimize for different kinds of workloads. Select this option, then select a
                  workload type from the **>>** list.

                  Configuration options:

                  **[Peak Frequency Optimized]** - Applies settings with performance and
                  power consumption balance. Recommended for users that need higher
                  performance.

                  **[Latency Optimized]** - Applies settings with low latency results.
                  Recommended for latency-sensitive users.

                  **[Power Efficient Optimized]** - Applies settings with power efficiency.
                  Recommended for general users.

                  **[HPC]** - Applies settings with optimized compute capability. Recommend
                  for traditional HPC applications.

> **Core Optimizer** and **Engine Boost** appear only when you set **Optimized Performance Setting** to **[Default]** or **[By Benchmark]**.

## Core Optimizer [Disabled]

Enable this item to keep the processor operating at the turbo frequency.
Configuration options: [Disabled] [Enabled]

> Linux support may vary by version of the OS.

## Engine Boost [Disabled]

Enable this item to boost the CPU's frequency.
Configuration options: [Disabled] [Level1] [Level2] [Level3(Max)]

**Overclocking [Disabled]**

Enable this item to increase the CPU's clock.
Configuration options: [Disabled] [Level1] [Level2] [Level3(Max)]

Operate with an ambient temperature of 25°C or lower for optimized performance.

Please note that overclocking might cause component damage or system crashes, which may reduce the lifespan of the system and the CPU. Use this tool at your own risk.

## 4.5 Advanced menu

The Advanced menu items allow you to change the settings for the CPU and other system devices.

> Take caution when changing the settings of the Advanced menu items. Incorrect field values can cause the system to malfunction.

```
                Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
     Main  Advanced  Chipset  Security  Boot  Tool  Save & Exit  AMD CBS  AMD PBS Option          ▶

  ▶ Trusted Computing                                        Trusted Computing Settings
  ▶ PSP Firmware Versions
  ▶ APM Configuration
  ▶ Onboard LAN Configuration
  ▶ Serial Port Console Redirection
  ▶ CPU Configuration
  ▶ PCI Subsystem Settings
  ▶ USB Configuration
  ▶ CSM Configuration
  ▶ NVMe Configuration
  ▶ SATA Configuration

  ▶ Tls Auth Configuration
  ▶ Network Stack Configuration                              ➜←: Select Screen
  ▶ AMD Mem Configuration Status                             ↑↓: Select Item
  ▶ iSCSI Configuration                                      Enter: Select
                                                             +/-: Change Opt.
                                                             F1: General Help
                                                             F2: Previous Values
                                                             F5: Optimized Defaults
                                                             F10: Save & Reset
                                                             F12: Print Screen
                                                             ESC: Exit


                Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.
```

## 4.5.1    Trusted Computing

```
              Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
     Advanced

 Configuration                                          Enables or Disables BIOS
   Security Device Support          [Enable]            support for security device.
   NO Security Device Found                             O.S. will not show Security
                                                        Device. TCG EFI protocol and
                                                        INT1A interface will not be
```

**Configuration**

**Security Device Support [Disabled]**
Allows you to enable or disable the BIOS support for security device.
Configuration options: [Disabled] [Enabled]

## 4.5.2    PSP Firmware Versions

This page displays the PSP firmware versions.

```
                 Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
      Advanced

  PSP Firmware Versions

  PSP Directory Level 1 (Fixed)
  PSP Recovery BL Ver            FF.C.0.68
  SMU FW Version                 0.36.74.0
  ABL Version                    00000000
  APCB Version                   0000
  APOB Version                   0000
  APPB Version                   0000

  PSP Directory Level 2 (Updateable)
  PSP BootLoader Version         0.C.0.68
  SMU FW Version                 0.36.74.0
  ABL Version                    00000000          ++: Select Screen
  APCB Version                   0000              ↑↓: Select Item
  APOB Version                   0000              Enter: Select
  APPB Version                   0000              +/-: Change Opt.
                                                   F1: General Help
                                                   F2: Previous Values
                                                   F5: Optimized Defaults
                                                   F10: Save & Reset
                                                   F12: Print Screen
                                                   ESC: Exit

                   Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.
```

## 4.5.3 APM Configuration

Allows you to configure the Advance Power Management (APM) settings.

```
                    Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
            Advanced

    Restore AC Power Loss                    [Last State]            Restore On AC Power Loss
    Power On By PCI-E/PCI                     [Disabled]
    Power On By RTC                           [Disabled]
```
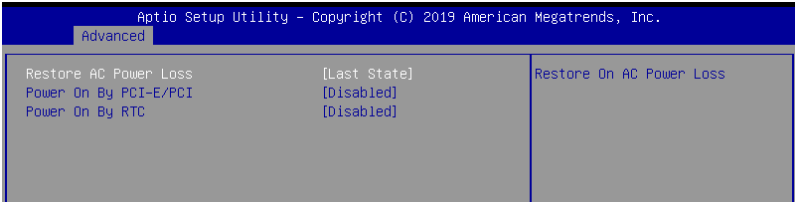
**Restore AC Power Loss [Last State]**
When set to [Power Off], the system goes into off state after an AC power loss. When set to [Power On], the system will reboot after an AC power loss. When set to [Last State], the system goes into either off or on state, whatever the system state was before the AC power loss.
Configuration options: [Power Off] [Power On] [Last State]

**Power On By PCI-E/PCI [Disabled]**

[Disabled]        Disables the PCIE devices to generate a wake event.

[Enabled]         Enables the PCIE devices to generate a wake event.

**Power On By RTC [Disabled]**

[Disabled]        Disables RTC to generate a wake event.

[Enabled]         When set to [Enabled], the items **RTC Alarm Date (Days)** and **Hour/Minute/Second** will become user-configurable with set values.

## 4.5.4 Onboard LAN Configuration

```
              Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
         Advanced

   Onboard I350 LAN Configuration                                Intel LAN Enable/Disable

   Intel I350 LAN1
      LAN Enable                     [JumperState]
      ROM Type                       [PXE]
      LAN MAC                        10:7B:44:7A:0A:9B
   Intel I350 LAN2
      LAN Enable                     [JumperState]
      ROM Type                       [Disabled]
      LAN MAC                        10:7B:44:7A:0A:9A
```
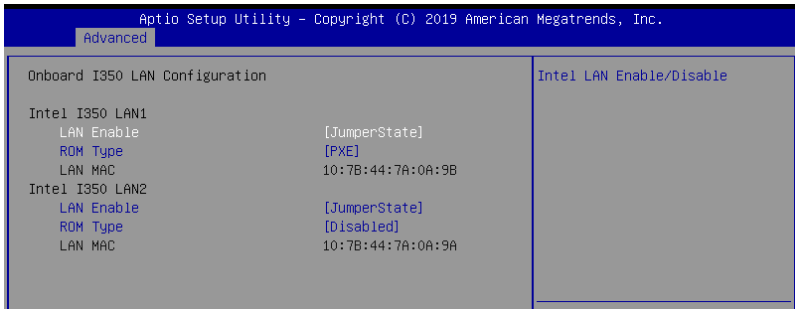
### Onboard I350 LAN Configuration

### Intel LAN1 I350

### LAN Enable [JumperState]
Allows you to enable or disable the Intel LAN.
Configuration options: [Disabled] [JumperState]

> The following items appear only when **LAN Enable** is set to **[JumperState]**.

#### ROM Type [PXE]
Allows you to select the Intel LAN ROM type.
Configuration options: [PXE] [iSCSI] [Disabled]

### Intel LAN2 I350

### LAN Enable [JumperState]
Allows you to enable or disable the Intel LAN.
Configuration options: [Disabled] [JumperState]

> The following items appear only when **LAN Enable** is set to **[JumperState]**.

#### ROM Type [Disabled]
Allows you to select the Intel LAN ROM type.
Configuration options: [PXE] [iSCSI] [Disabled]

## 4.5.5    Serial Port Console Redirection

```
                  Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
          Advanced

                                                                Console Redirection Enable or
   COM1                                                         Disable.
   Console Redirection              [Disabled]
 ▶ Console Redirection Settings

   COM2
   Console Redirection              [Disabled]
 ▶ Console Redirection Settings

   Legacy Console Redirection
 ▶ Legacy Console Redirection Settings

   Serial Port for Out-of-Band Management/
   Windows Emergency Management Services (EMS)         ↔: Select Screen
   Console Redirection              [Disabled]         ↑↓: Select Item
 ▶ Console Redirection Settings                        Enter: Select
                                                       +/-: Change Opt.
```

### COM1/COM2

#### Console Redirection [Disabled]
Allows you to enable or disable the console redirection feature.
Configuration options: [Disabled] [Enabled]

🖉      The following item appears only when you set **Console Redirection** to **[Enabled]**.

#### Console Redirection Settings
These items become configurable only when you enable the **Console Redirection** item. The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

#### Terminal Type [ANSI]
Allows you to set the terminal type.

[VT100]          ASCII char set.
[VT100+]         Extends VT100 to support color, function keys, etc.
[VT-UTF8]        Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
[ANSI]           Extended ASCII char set.

#### Bits per second [115200]
Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.
Configuration options: [9600] [19200] [38400] [57600] [115200]

#### Data Bits [8]
Configuration options: [7] [8]

**Parity [None]**
A parity bit can be sent with the data bits to detect some transmission errors. [Mark] and [Space] parity do not allow for error detection.

[None]           None
[Even]           parity bit is 0 if the num of 1's in the data bits is even
[Odd]            parity bit is 0 if num of 1's in the data bits is odd
[Mark]           parity bit is always 1
[Space]          parity bit is always 0

**Stop Bits [1]**
Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning.) The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.
Configuration options: [1] [2]

**Flow Control [None]**
Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a "stop" signal can be sent to stop the data flow. Once the buffers are empty, a "start" signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.
Configuration options: [None] [Hardware RTS/CTS]

**VT -UTF8 Combo Key Support [Enabled]**
This allows you to enable the VT -UTF8 Combination Key Support for ANSI/VT100 terminals.
Configuration options: [Disabled] [Enabled]

**Recorder Mode [Disabled]**
With this mode enabled only text will be sent. This is to capture Terminal data.
Configuration options: [Disabled] [Enabled]

**Resolution 100x31 [Disabled] [Enabled]**
This allows you to enable or disable extended terminal resolution.
Configuration options: [Disabled] [Enabled]

**Putty Keypad [VT100]**
This allows you to select the FunctionKey and Keypad on Putty.
Configuration options: [VT100] [LINUX] [XTERMR6] [SCO] [ESCN] [VT400]

## Legacy Console Redirection Settings

## Redirection COM Port [COM1]
Allows you to select a COM port to display redirection of Legacy OS and Legacy OPROM Messages.
Configuration options: [COM1] [COM2]

## Resolution [80x24]
This allows you to set the number of rows and columns supported on the Legacy OS.
Configuration options: [80x24] [80x25]

## Redirect After POST [Always Enable]
This setting allows you to specify if Bootloader is selected than Legacy console redirection.
Configuration options: [Always Enable] [Bootloader]

**Serial Port for Out-of-Band Management/**
**Windows Emergency Management Services (EMS)**

**Console Redirection [Disabled]**
Allows you to enable or disable the console redirection feature.
Configuration options: [Disabled] [Enabled]

The following item appears only when you set **Console Redirection** to **[Enabled]**.

**Console Redirection Settings**

**Out-of-Band Mgmt Port [COM1]**
Microsoft Windows Emergency Management Services (EMS) allow for remote
management of a Windows Server OS through a serial port.
Configuration options: [COM1] [COM2]

**Terminal Type [VT-UTF8]**
Microsoft Windows Emergency Management Services (EMS) allow for remote
management of a Windows Server OS through a serial port.
Configuration options: [VT100] [VT100+] [VT-UTF8] [ANSI]

**Bits per second [115200]**
Microsoft Windows Emergency Management Services (EMS) allow for remote
management of a Windows Server OS through a serial port.
Configuration options: [9600] [19200] [57600] [115200]

**Flow Control [None]**
Microsoft Windows Emergency Management Services (EMS) allow for remote
management of a Windows Server OS through a serial port.
Configuration options: [None] [Hardware RTS/CTS] [Software Xon/Xoff]

## 4.5.6 CPU Configuration

This page displays the CPU node information.

```
                   Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
        Advanced

   CPU Configuration                                              Enable/disable CPU
                                                                  Virtualization

   SVM Mode                              [Enable]
   SMEE                                  [Enable]
 ▶ Node 0 Information
```
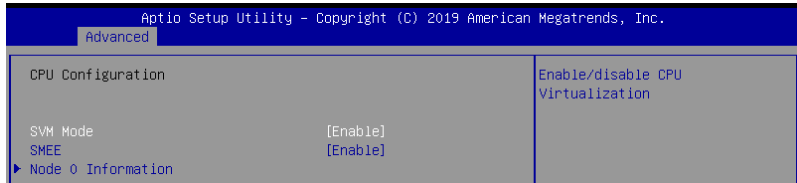
### SVM Mode [Enabled]
Allows you to enable or disable SVM Mode.
Configuration options: [Disabled] [Enabled]

### SMEE [Enabled]
Allows you to enable or disable SMEE.
Configuration options: [Disabled] [Enabled]

### Node 0 Information
This page displays the Node 0 Information.

## 4.5.7 PCI Subsystem Settings

Allows you to configure PCI, PCI-X, and PCI Express Settings.

```
                   Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
        Advanced

   AMI PCI Driver Version :   A5.01.19                           Globally Enables or Disables
                                                                 64bit capable Devices to be
   PCI Settings Common for all Devices:                          Decoded in Above 4G Address
   Above 4G Decoding                     [Enabled]               Space (Only if System Supports
   SR-IOV Support                        [Enabled]               64 bit PCI Decoding).
   BME DMA Mitigation                    [Disabled]

 ▶ PCIE OPROM Slot Options
```

### Above 4G Decoding [Enabled]
Allows you to enable or disable 64-bit capable devices to be decoded in above 4G address space. It only works if the system supports 64-bit PCI decoding.
Configuration options: [Disabled] [Enabled]

### SR-IOV Support [Enabled]
This option enables or disables SIngle Root IO Virtualization Support if the system has SR-IOV capable PCIe devices.
Configuration options: [Disabled] [Enabled]

### BME DMA Mitigation [Disabled]
This allows you to enable or disable re-enabling Bus Master Attribute disabled during PCI enumeration for PCI Bridges after SMM locked.
Configuration options: [Disabled] [Enabled]

### PCIE OPROM Slot Options
This page allows you to enable or disable OpROM on each PCIe Slot.

## 4.5.8    USB Configuration

```
              Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
        Advanced

  USB Configuration                                        Enables Legacy USB support.
                                                           AUTO option disables legacy
  USB Module Version              23                       support if no USB devices are
                                                           connected. DISABLE option will
  USB Controllers:                                         keep USB devices available
      2 XHCIs                                              only for EFI applications.
  USB Devices:
      1 Drive, 1 Keyboard, 2 Hubs

  Legacy USB Support              [Enabled]
  XHCI Hand-off                   [Enabled]
  USB Mass Storage Driver Support [Enabled]
  Port 60/64 Emulation            [Enabled]

  USB hardware delays and time-outs:                       →←: Select Screen
  USB transfer time-out           [20 sec]                 ↑↓: Select Item
  Device reset time-out           [20 sec]                 Enter: Select
  Device power-up delay           [Auto]                   +/-: Change Opt.
                                                           F1: General Help
  Mass Storage Devices:                                    F2: Previous Values
  JetFlashTranscend 4GB 8.07      [Auto]                   F5: Optimized Defaults
                                                           F10: Save & Reset
                                                           F12: Print Screen
                                                           ESC: Exit


              Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.
```

**Legacy USB Support [Enabled]**
Allows you to enable or disable Legacy USB device support.
Configuration options: [Enabled] [Disabled] [Auto]

**XHCI Hand-off [Enabled]**
Allows you to enable or disable workaround for OSes without XHCI hand-off support. The
XHCI ownership change should be claimed by XHCI driver.
Configuration options: [Enabled] [Disabled]

**USB Mass Storage Driver Support [Enabled]**
Allows you to enable or disable the USB Mass Storage driver support.
Configuration options: [Disabled] [Enabled]

**Port 60/64 Emulation [Enabled]**
Allows you to enable or disable I/O port 60h/64h emulation support. This should be enabled
for the complete keyboard legacy support for non-USB aware OSes.
Configuration options: [Disabled] [Enabled]

## USB hardware delays and time-outs

### USB transfer time-out [20 sec]
Allows you to select time-out value for Control, Bulk, and Interrupt transfers.
Configuration options: [1 sec] [5 sec] [10 sec] [20 sec]

### Device reset time-out [20 sec]
Allows you to select time-out value for USB mass storage device Start Unit command.
Configuration options: [10 sec] [20 sec] [30 sec] [40 sec]

### Device power-up delay [Auto]
Allows you to select maximum time the device will take before it properly reports itself to the Host Controller.
Configuration options: [Auto] [Manual]

## Mass Storage Devices

### AMI Virtual CDROM0-2 / Floppy / HDisk0 1.00 [Auto]
Allows you to select the mass storage device emulation type.
Configuration options: [Auto] [Floppy] [Forced FDD] [Hard Disk] [CD-ROM]

## 4.5.9    CSM Configuration

```
              Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
          Advanced

   Compatibility Support Module Configuration              Enable/Disable CSM Support.

   CSM Support                        [Enabled]

   CSM16 Module Version               07.82

   GateA20 Active                     [Upon Request]
   Option ROM Messages                [Force BIOS]
   INT19 Trap Response                [Immediate]
   HDD Connection Order               [Adjust]

   Boot option filter                 [Legacy only]

   Option ROM execution                                     →←: Select Screen
                                                            ↑↓: Select Item
   Network                            [Legacy]              Enter: Select
   Storage                            [Legacy]              +/-: Change Opt.
   Video                              [Legacy]              F1: General Help
   Other PCI devices                  [Legacy]              F2: Previous Values
                                                            F5: Optimized Defaults
```

### CSM Support [Enabled]
This option allows you to enable or disable CSM Support.
Configuration options: [Disabled] [Enabled]

> The following item appears only when **CSM Support** is set to **[Enabled]**.

#### GateA20 Active [Upon Request]
This allows you to set the GA20 option.
Configuration options: [Upon Request] [Always]

**Option ROM Messages [Force BIOS]**
This allows you to set the display mode for option ROM.
Configuration options: [Force BIOS] [Keep Current]

**INT19 Trap Response [Immediate]**
[Immediate]          Execute the trap right away.
[Postponed]          Execute the trap during legacy boot.

**HDD Connection Order [Adjust]**
This option allows you to change the HDD order required for some OSes.
Configuration options: [Adjust] [Keep]

**Boot Option filter [Legacy only]**
This option allows you to control the Legacy/UEFI ROMs priority.
Configuration options: [UEFI and Legacy] [Legacy only] [UEFI only]

**Network / Storage / Video [Legacy]**
This option allows you to control the execution of UEFI and Legacy PXE / Storage / Video OpROM.
Configuration options: [UEFI] [Legacy]

**Other PCI devices [Legacy]**
This item determines the OpROM execution policy for devices other than Network, Storage, or Video.
Configuration options: [UEFI] [Legacy]

## 4.5.10    NVMe Configuration

This page will display the NVMe controller and drive information.

```
             Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
      Advanced

  NVMe Configuration

  No NVME Device Found
```
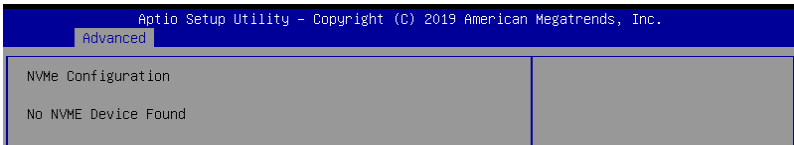
## 4.5.11 SATA Configuration

This page will display the SATA controller and drive information.

```
           Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
     Advanced

  SATA Configuration

  SATA Controller (S:00 B:43 D:00 F:00)
  Port 0                            Not Present
  Port 1                            Not Present
  Port 2                            Not Present
  Port 3                            Not Present
  Port 4                            Not Present
  Port 5                            Not Present
  Port 6                            Not Present
  Port 7                            Not Present

  SATA Controller (S:00 B:44 D:00 F:00)
  Port 0                            Not Present
  Port 1                            Not Present        →←: Select Screen
  Port 2                            Not Present        ↑↓: Select Item
  Port 3                            Not Present        Enter: Select
  Port 4                            Not Present        +/-: Change Opt.
  Port 5                            Not Present        F1: General Help
  Port 6                            Not Present        F2: Previous Values
  Port 7                            Not Present        F5: Optimized Defaults
                                                       F10: Save & Reset
  SATA Controller (S:00 B:84 D:00 F:00)               F12: Print Screen
  Port 0                            Not Present        ESC: Exit
  Port 1                            Not Present

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```

## 4.5.12 Tls Auth Configuration

Allows you to configure the Tls parameters.

```
           Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
     Advanced

  ▶ Server CA Configuration                            Press <Enter> to configure
                                                       Server CA.
  ▶ Client Cert Configuration
```

## 4.5.13 Network Stack Configuration

```
                    Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
           Advanced

  Network Stack                          [Disabled]                   Enable/Disable UEFI Network
                                                                      Stack
```
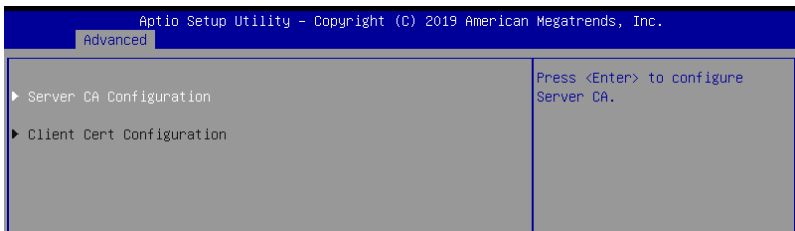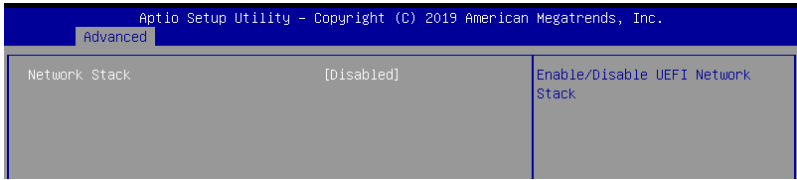
**Network stack [Disabled]**
Enables or disables the network stack feature.
Configuration options: [Disable] [Enable]

> The following item appears only when **Network stack** is set to **[Enabled]**.

**Ipv4 PXE Support [Disabled]**
Enables or disables the Ipv4 PXE Boot Support. If disabled, Ipv4 PXE boot option will not be created.
Configuration options: [Disabled] [Enabled]

**Ipv4 HTTP Support [Disabled]**
Enables or disables the Ipv4 HTTP Boot Support. If disabled, Ipv4 HTTP boot option will not be created.
Configuration options: [Disabled] [Enabled]

**Ipv6 PXE Support [Disabled]**
Enables or disables the Ipv6 PXE Boot Support. If disabled, Ipv6 PXE boot option will not be created.
Configuration options: [Disabled] [Enabled]

**Ipv6 HTTP Support [Disabled]**
Enables or disables the Ipv6 HTTP Boot Support. If disabled, Ipv6 HTTP boot option will not be created.
Configuration options: [Disabled] [Enabled]

**IPSEC Certificate [Disabled]**
This item allows you to enable or disable IPSEC Certificate for Ikev.
Configuration options: [Disabled] [Enabled]

**PXE boot wait time [0]**
Wait time to press ESC key to abort the PXE boot.

**Media detect time [1]**
Wait time (in seconds) to detect media.

## 4.5.14    AMD Mem Configuration Status

Allows you to view the memory status.

```
              Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
      Advanced
▶ Socket 0                                                    Socket-specific memory
▶ Socket 1                                                    configuration status
  Mbist Test Enable                        Disabled, 0xC003
  Mbist Aggressor Enable                   Disabled, 0xC000
  Mbist Per Bit Slave Die Report           0x0000, 0xC000
  Dram Temp Controlled Refresh             Disabled, 0xC000
  Enable
  User Timing Mode                         Disabled, 0xC015
  User Timing Value                        Disabled, 0xC015
```

## 4.5.15    iSCSI Configuration

Allows you to configure the iSCSi parameters.

```
              Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
      Advanced
  iSCSI Initiator Name                                        The worldwide unique name of
                                                              iSCSI Initiator. Only IQN
▶ Add an Attempt                                              format is accepted. Range is
                                                              from 4 to 223
▶ Delete Attempts

▶ Change Attempt Order
```

## 4.6    Chipset menu

The Chipset menu items allow you to change the Chipset settings.

```
              Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
      Main   Advanced   Chipset   Security   Boot   Tool   Save & Exit   AMD CBS   AMD PBS Option

    PCIe Link Training Type              [1 Step]            PCIe Link training in 1 or 2
    PCIe Compliance Mode                 [Off]               steps.
  ▶ North Bridge
```
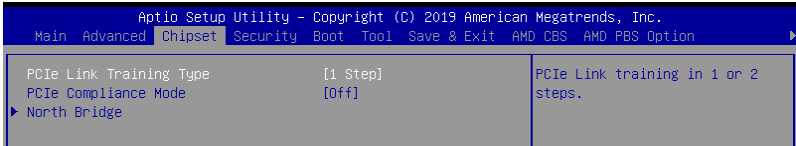
### PCIe Link Training Type [1 Step]
Allows you to select the PCIe training in 1 or 2 steps.
Configuration options: [1 Step] [2 Step]

### PCIe Compliance Mode [Off]
Allows you to select the PCIe Compliance Mode.
Configuration options: [On] [Off]

### North Bridge

### Memory Configuration

#### Socket 0 Information
This item displays the memory information on Socket 0.

#### Socket 1 Information
This item displays the memory information on Socket 1.

## 4.7     Security menu

This menu allows a new password to be created or a current password to be changed. The menu also enables or disables the Secure Boot state and lets the user configure the System Mode state.

```
                    Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
       Main  Advanced  Chipset  Security  Boot  Tool  Save & Exit  AMD CBS  AMD PBS Option         ▶

    Password Description                                    Set Administrator Password

    If ONLY the Administrator's password is set,
    then this only limits access to Setup and is
    only asked for when entering Setup.
    If ONLY the User's password is set, then this
    is a power on password and must be entered to
    boot or enter Setup. In Setup the User will
    have Administrator rights.
    The password length must be
    in the following range:
    Minimum length                    3
    Maximum length                   20                     ↔: Select Screen
                                                            ↑↓: Select Item
    Administrator Password                                  Enter: Select
    User Password                                           +/-: Change Opt.
                                                            F1: General Help
  ▶ Secure Boot                                             F2: Previous Values
                                                            F5: Optimized Defaults
                                                            F10: Save & Reset
                                                            F12: Print Screen
                                                            ESC: Exit
```

**Administrator Password**

To set an administrator password:

1.     Select the Administrator Password item and press <Enter>.

2.     From the Create New Password box, key in a password, then press <Enter>.

3.     Confirm the password when prompted.

To change an administrator password:

1.     Select the Administrator Password item and press <Enter>.

2.     From the Enter Current Password box, key in the current password, then press <Enter>.

3.     From the Create New Password box, key in a new password, then press <Enter>.

4.     Confirm the password when prompted.

---

To clear the administrator password, follow the same steps as in changing an administrator password, but press <Enter> when prompted to create/confirm the password.

---

## User Password

To set a user password:

1.      Select the User Password item and press <Enter>.

2.      From the Create New Password box, key in a password, then press <Enter>.

3.      Confirm the password when prompted.

To change a user password:

1.      Select the User Password item and press <Enter>.

2.      From the Enter Current Password box, key in the current password, then press <Enter>.

3.      From the Create New Password box, key in a new password, then press <Enter>.

4.      Confirm the password when prompted.

To clear a user password:

1.      Select the Clear User Password item and press <Enter>.

2.      Select **Yes** from the Warning message window then press <Enter>.

## Secure Boot
This item allows you to customize the Secure Boot settings.
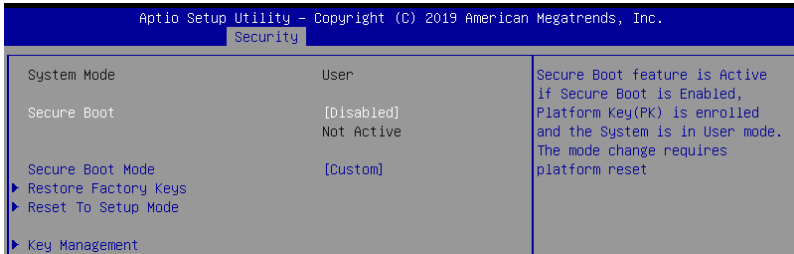


## Secure Boot [Disabled]

Secure Boot can be enabled if the system is running in User mode with enrolled platform Key (EPK) or if the CSM function is disabled.
Configuration options: [Disabled] [Enabled]

## Secure Boot Mode [Custom]

Allows you to set the Secure Boot selector.
Configuration options: [Custom] [Standard]

## Restore Factory Keys

This option will force the system to User Mode, and install factory default Secure Boot key databases.

## Reset to Setup Mode

This option will delete all Secure Boot key databases from NVRAM.

## Key Management

This item only appears when the item Secure Boot Mode is set to [Custom]. The Key Management item allows you to modify Secure Boot variables and set Key Management page.

```
          Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
                              Security

   Vendor Keys               Valid                  Install factory default Secure
                                                    Boot keys after the platform
   Factory Key Provision     [Enabled]              reset and while the System is
 ▶ Restore Factory Keys                             in Setup mode
 ▶ Reset To Setup Mode
 ▶ Export Secure Boot variables
 ▶ Enroll Efi Image

   Device Guard Ready
 ▶ Remove 'UEFI CA' from DB
 ▶ Restore DB defaults

   Secure Boot variable | Size| Keys| Key Source
 ▶ Platform Key(PK)     |  886|    1| Factory      ↔: Select Screen
 ▶ Key Exchange Keys    | 3573|    3| Factory      ↑↓: Select Item
 ▶ Authorized Signatures| 6322|   10| Factory      Enter: Select
 ▶ Forbidden  Signatures| 3724|   77| Factory      +/-: Change Opt.
 ▶ Authorized TimeStamps|    0|    0| No Keys      F1: General Help
 ▶ OsRecovery Signatures|    0|    0| No Keys      F2: Previous Values
                                                    F5: Optimized Defaults
```

**Factory Key Provision [Enabled]**

Allows you to provision factory default Secure Boot keys when the system is in Setup Mode.
Configuration options: [Disabled] [Enabled]

**Restore Factory keys**

This item will install all Factory Default keys.

**Reset to Setup Mode**

This item appears only when you load the default Secure Boot keys. This item allows you to clear all default Secure Boot keys.

**Export Secure Boot Variables**

This item will ask you if you want to save all secure boot variables. Select Yes if you want to save all secure boot variables, otherwise select No.

**Enroll Efi Image**

This item will allow the image to run in Secure Boot mode.
Configuration options: [Set New] [Append]

**Device Guard Ready**

**Remove 'UEFI CA' from DB**

Remove Microsoft UEFI CA from Secure Boot DB.

**Restore DB defaults**

Restore DB variable to factory defaults.

**Platform Key (PK)**

Configuration options: [Details] [Export] [Update] [Delete]

**Key Exchange Keys (KEK) / Authorized Signatures (DB) / Forbidden Signatures (DBX)**

Configuration options: [Details] [Export] [Update] [Append] [Delete]

**Authorized TimeStamps (DBT) / OsRecovery Signatures**

Configuration options: [Update] [Append]

## 4.8 Boot menu

The Boot menu items allow you to change the system boot options.

```
         Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
     Main  Advanced  Chipset  Security  Boot  Tool  Save & Exit  AMD CBS  AMD PBS Option

 Boot Configuration                                      Number of seconds to wait for
 Setup Prompt Timeout            1                       setup activation key.
 Bootup NumLock State            [On]                    65535(0xFFFF) means indefinite
 Quiet Boot                      [Disabled]              waiting.

 Boot Option Priorities
 Boot Option #1                  [JetFlashTranscend 4GB
                                 8.07]
 Boot Option #2                  [IBA GE Slot C300
                                 v1578]
   POST Report                   [5 sec]

                                                        ++: Select Screen
 Hard Drive BBS Priorities                              ↑↓: Select Item
 Network Device BBS Priorities                          Enter: Select
                                                        +/-: Change Opt.
```

**Setup Prompt Timeout [1]**
Allows you to set the number of seconds to wait for setup activation key.

**Bootup NumLock State [On]**
Allows you to select the power-on state for the NumLock.
Configuration options: [Off] [On]

**Quiet Boot [Disabled]**
Allows you to enable or disable Quiet Boot.
Configuration options: [Disabled] [Enabled]

> **POST Report [5 sec]**
> Allows you to set the desired POST Report waiting time from 1 to 10 seconds.
> Configuration options: [1 sec] ~ [10 sec] [Until Press ESC]

**Boot Option Priorities**
These items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.

> • To select the boot device during system startup, press <F8> when ASUS Logo appears.
>
> • To access Windows OS in Safe Mode, please press <F8> after POST.

**Floppy Drive BBS Priorities / Hard Drive BBS Priorities / CD/DVD ROM Drive BBS Priorities**
These items appear only when you connect Floppy / SATA ODD or HDD to the SATA ports and allow you to set the booting order of the SATA devices.

## 4.9 Tool menu

The Tool menu items allow you to configure options for special functions. Select an item then press <Enter> to display the submenu.

```
          Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
     Main  Advanced  Chipset  Security  Boot  Tool  Save & Exit  AMD CBS  AMD PBS Option

                                                         IPMI HWM
      IPMI HWM
      Start ASUS EzFlash
```

**IPMI HWM**
Allows you to run the IPMI hardware monitor.

**Start EZ Flash**
Allows you to run ASUS EZ Flash BIOS ROM Utility when you press <Enter>. Refer to the ASUS EZ Flash Utility section for details.

## 4.10 Save & Exit menu

The Exit menu items allow you to save or discard your changes to the BIOS items.

```
          Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
     Main  Advanced  Chipset  Security  Boot  Tool  Save & Exit  AMD CBS  AMD PBS Option

      Save Options                                       Exit system setup after saving
      Save Changes and Exit                              the changes.
      Discard Changes and Exit

      Save Changes and Reset
      Discard Changes and Reset

      Save Changes
      Discard Changes

      Default Options
      Restore Defaults
      Save as User Defaults
      Restore User Defaults                              ++: Select Screen
                                                         ↑↓: Select Item
      Boot Override                                      Enter: Select
      JetFlashTranscend 4GB 8.07                         +/-: Change Opt.
      IBA GE Slot C300 v1578                             F1: General Help
      Launch EFI Shell from filesystem device           F2: Previous Values
                                                         F5: Optimized Defaults
                                                         F10: Save & Reset
                                                         F12: Print Screen
                                                         ESC: Exit
```

Pressing <Esc> does not immediately exit this menu. Select one of the options from this menu or <F10> from the legend bar to exit.

## Save Changes and Exit
Exit system setup after saving the changes.

## Discard Changes and Exit
Exit system setup without saving any changes.

## Save Changes and Reset
Rest system setup after saving the changes.

## Discard Changes and Rest
Rest system setup without saving any changes.

## Save Changes
Save changes done so far to any of the setup options.

## Discard Changes
Discard changes done so far to any of the setup options.

## Restore Defaults
Restore/load default values for all the setup options.

## Save as User Defaults
Save all the current setup options as user default values.

## Restore as User Defaults
Restore/load user default values for all the setup options.

## Boot Override
These items displays the available devices. The device items that appears on the screen depends on the number of devices installed in the system. Click an item to start booting from the selected device.

# 4.11    AMD CBS menu

The Exit menu items allow you to save or discard your changes to the BIOS items.

```
              Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
       Main   Advanced   Chipset   Security   Boot   Tool   Save & Exit   AMD CBS   AMD PBS Option        ▶

  AMD CBS                                                 CPU Common Options

 ▶ CPU Common Options
 ▶ DF Common Options
 ▶ UMC Common Options
 ▶ NBIO Common Options
 ▶ FCH Common Options
 ▶ NTB Common Options
 ▶ Soc Miscellaneous Control
```

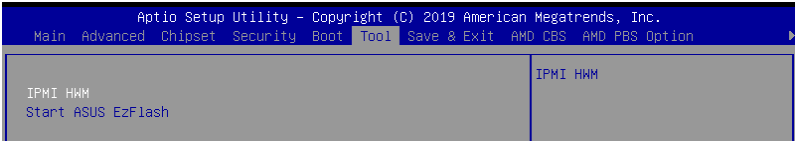## 4.11.1    CPU Common Options
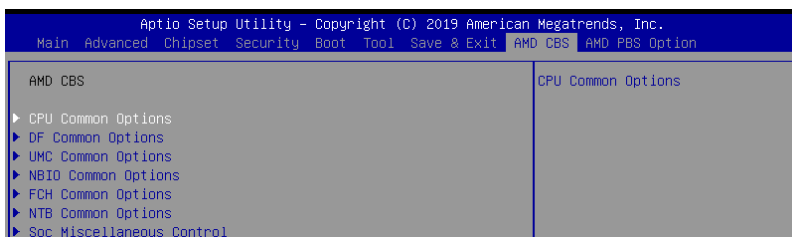
```
              Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
                                                                     AMD CBS

  CPU Common Options                                       Performance

 ▶ Performance
 ▶ Prefetcher settings
 ▶ Core Watchdog
```

### Performance

**Custom Core Pstates**
This option allows you to enable Core Pstates. Read the disclaimer and select **I Accept** to continue.

**CCD/Core/THread Enablement**
This option allows you to enable CCD/Core/THread Enablement. Read the disclaimer and select **I Accept** to continue.

### Prefetcher settings

**L1 Stream HW Prefetcher [Auto]**
This option allows you to enable or disable L1 Stream HW Prefetcher.
Configuration options: [Disabled] [Enabled] [Auto]

**L2 Stream HW Prefetcher [Auto]**
This option allows you to enable or disable L2 Stream HW Prefetcher.
Configuration options: [Disabled] [Enabled] [Auto]

### Core Watchdog

**Core Watchdog Timer Enable [Auto]**
This option allows you to enable or disable Core Watchdog Timer.
Configuration options: [Disabled] [Enabled] [Auto]

### Core Performance Boost [Auto]
Configuration options: [Disabled] [Auto]

### Global C-state Control [Auto]
Configuration options: [Disabled] [Enabled] [Auto]

## 4.11.2    DF Common Options

```
           Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
                                                           AMD CBS

    DF Common Options                                   Scrubber
  ▶ Scrubber
  ▶ Memory Addressing
  ▶ ACPI
  ▶ Link

    Disable DF to external IP        [Auto]
    SyncFloodPropagation
    Disable DF sync flood propagation [Auto]
    Freeze DF module queues on error  [Auto]
    CC6 memory region encryption      [Auto]
    System probe filter               [Auto]      ++: Select Screen
    Memory Clear                      [Auto]      ↑↓: Select Item
    PSP error injection support       [False]     Enter: Select
```

### Scrubber

**DRAM scrub time [Auto]**
Configuration options: [Disabled] [1 hour] [4 hours] [8 hours] [16 hours] [24 hours] [48 hours] [Auto]

**Poison scrubber control [Auto]**
Configuration options: [Disabled] [Enabled] [Auto]

**Redirect scrubber control [Auto]**
Configuration options: [Disabled] [Enabled] [Auto]

**Redirect scrubber limit [Auto]**
Configuration options: [2] [4] [Infinite] [Auto]

### Memory Addressing

**NUMA nodes per socket [Auto]**
Configuration options: [NPS0] [NPS1] [NPS2] [NPS4] [Auto]

**Memory interleaving [Auto]**
This option allows you to control fabric level memory interleaving.
Configuration options: [Disabled] [Auto]

**Memory interleaving size [Auto]**
This option allows you to control the memory interleaving size.
Configuration options: [256 Bytes] [512 Bytes] [1 KB] [2 KB] [Auto]

**1TB remap [Auto]**
Configuration options: [Do not remap] [Attempt to remap] [Auto]

**DRAM map inversion Auto]**
Configuration options: [Disabled] [Enabled] [Auto]

### Disable DF to external IP SyncFloodPropagation [Auto]
Configuration options: [Sync flood disabled] [Sync flood enabled] [Auto]

### Disable DF sync flood propagation [Auto]
Configuration options: [Sync flood disabled] [Sync flood enabled] [Auto]

### Freeze DF module queues on error [Auto]
Configuration options: [Disabled] [Enabled] [Auto]

### CC6 memory region encryption [Auto]
Configuration options: [Disabled] [Enabled] [Auto]

### System probe filter [Auto]
Configuration options: [Disabled] [Enabled] [Auto]

### Memory Clear [Auto]
Configuration options: [Disabled] [Enabled] [Auto]

### PSP error injection support [False]
Configuration options: [False] [True]

## 4.11.3    UMC Common Option

```
           Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                                                    AMD CBS

   UMC Common Options                              DDR4 Common Options

 ▶ DDR4 Common Options
 ▶ DRAM Memory Mapping
 ▶ NVDIMM
 ▶ Memory MBIST
```
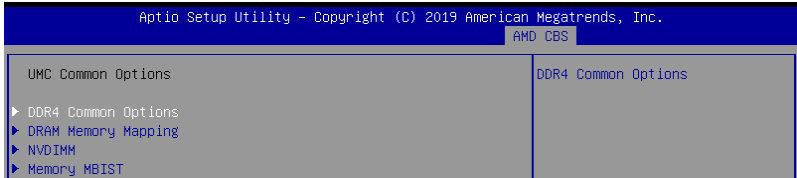
**DDR4 Common Options**

    **DRAM Timing Configuration**
    This option allows you to set memory overclock settings. Read the disclaimer and
    select **I Accept** to continue.

    **DRAM Controller Configuration**

    **Power Down Options**
        ***Power Down Enable [Auto]***
        This option allows you to enable or disable DDR power down mode.
        Configuration options: [Disabled] [Enabled] [Auto]

    **Cmd2T [Auto]**
    This option allows you to select between 1T and 2T mode on ADDR/CMD.
    Configuration options: [1T] [2T] [Auto]

**Gear Down Mode [Auto]**
This option allows you to select the Gear Down Mode.
Configuration options: [Disabled] [Enabled] [Auto]

**CAD Bus Configuration**

**CAD Bus Timing User Controls [Auto]**
This option allows you to set the setup time on CAD bus signals to Auto or manual.
Configuration options: [Manual] [Auto]

**CAD Bus Drive Strength User Controls [Auto]**
This option allows you to set the Drive Strength on CAD bus signals to Auto or manual.
Configuration options: [Manual] [Auto]

**Data Bus Configuration**

**Data Bus Configuration User Controls [Auto]**
This option allows you to interleave memory blocks across DRAM chip selects for node 0.
Configuration options: [Auto] [Manual]

---

The following item appears only when **Data Bus Configuration User Controls** is set to **[Manual]**.

---

**RttNom [Auto]**
Configuration options: [Rtt_Nom Disable] [RZQ/4] [RZQ/2] [RZQ/6] [RZQ/1] [RZQ/5] [RZQ/3] [RZQ/7] [Auto]

**RttWr [Auto]**
Configuration options: [Dynamic ODT Off] [RZQ/2] [RZQ/1] [Hi-Z] [RZQ/3] [Auto]

**RttPark [Auto]**
Configuration options: [Rtt_PARK Disable] [RZQ/4] [RZQ/2] [RZQ/6] [RZQ/1] [RZQ/5] [RZQ/3] [RZQ/7] [Auto]

**Common RAS**

**Data Poisoning [Auto]**
This option allows you to enable or disable Data Poisoning.
Configuration options: [Disabled] [Enabled] [Auto]

**DRAM Post Package Repair [Disabled]**
Configuration options: [Disabled] [Enabled]

**RCD Parity [Auto]**
Configuration options: [Disabled] [Enabled] [Auto]

**DRAM Address Command Parity Retry [Auto]**
Configuration options: [Disabled] [Enabled] [Auto]

**Write CRC Enable [Auto]**
Configuration options: [Disabled] [Enabled] [Auto]

**DRAM Write CRC Enable and Retry Limit [Auto]**
Configuration options: [Disabled] [Enabled] [Auto]

**Disable Memory Error Injection [True]**
Configuration options: [False] [True]

**ECC Configuration**

### *DRAM ECC Symbol Size [Auto]*
This option allows you to set the DRAM ECC Symbol Size.
Configuration options: [Auto] [x4] [x8]

### *DRAM ECC Enable [Auto]*
This option allows you to enable or disable DRAM ECC.
Configuration options: [Disabled] [Enabled] [Auto]

### *DRAM UECC Retry [Auto]*
This option allows you to enable or disable DRAM UECC Retry.
Configuration options: [Disabled] [Enabled] [Auto]

**Security**

**TSME [Auto]**
Configuration options: [Disabled] [Enabled] [Auto]

**Data Scramble [Auto]**
Configuration options: [Disabled] [Enabled] [Auto]


## DRAM Memory Mapping

**Chipselect Interleaving [Auto]**
This option allows you to interleave memory blocks across DRAM chip selects for node 0.
Configuration options: [Disabled] [Auto]

**BankGroupSwap [Auto]**
Configuration options: [Disabled] [Enabled] [Auto]

**Address Hash Bank [Auto]**
Configuration options: [Disabled] [Enabled] [Auto]

**Address Hash CS [Auto]**
Configuration options: [Disabled] [Enabled] [Auto]

**Address Hash Rm [Auto]**
Configuration options: [Disabled] [Enabled] [Auto]

**SPD Read Optimization [Auto]**
Configuration options: [Disabled] [Enabled] [Auto]

## 4.11.4    NBIO Common Options

```
                Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
                                                                      AMD CBS

    NBIO Common Options                                        Enable/Disable IOMMU

    IOMMU                            [Auto]
    ACS Enable                       [Auto]
    PCIe ARI Support                 [Auto]
    PCIe Ten Bit Tag Support         [Auto]
    HD Audio Enable                  [Auto]
  ▶ SMU Common Options
  ▶ NBIO RAS Common Options
    Enable AER Cap                   [Auto]
    Early Link Speed                 [Auto]
    Hot Plug Handling mode           [Auto]
    Presence Detect Select mode      [Auto]
    Preferred IO Device              0
                                                             ++: Select Screen
                                                             ↑↓: Select Item
                                                             Enter: Select
                                                             +/-: Change Opt.
                                                             F1: General Help
```

**IOMMU [Auto]**

This option allows you to enable or disable IOMMU.
Configuration options: [Disabled] [Enabled] [Auto]

**ACS Enable [Auto]**

Configuration options: [Disabled] [Enabled] [Auto]

**PCIe ARI Support [Auto]**

Configuration options: [Disabled] [Enabled] [Auto]

**PCIe Ten Bit Tag Support [Auto]**

Configuration options: [Disabled] [Enabled] [Auto]

**SMU Common Options**

> **Determinism Control [Auto]**
> Configuration options: [Disabled] [Enabled] [Auto]
>
> **cTDP Control [Manual]**
> This option allows you to set the cTDP.
> Configuration options: [Manual] [Auto]

The following item appears only when **cTDP Control** is set to **[Manual]**.

> ***cTDP [200]***
> This option allows you to set the cTDP value.

**Package Power Limit Control [Manual]**
Configuration options: [Disabled] [Enabled] [Auto]

> The following item appears only when **cTDP Control** is set to **[Manual]**.

### Package Power Limit [240]
This option allows you to set the cTDP value.

**APBDIS [Auto]**
Configuration options: [Disabled] [Enabled] [Auto]

**DF Cstates [Auto]**
Configuration options: [Disabled] [Enabled] [Auto]

**CPPC [Auto]**
Configuration options: [Disabled] [Enabled] [Auto]

**BoostFmaxEn [Auto]**
Configuration options: [Disabled] [Enabled] [Auto]

## NBIO RAS Common Options

**Determinism Control [Auto]**
Configuration options: [Manual] [Auto]

**NBIO RAS Global Control [Auto]**
Configuration options: [Disabled] [Enabled] [Auto]

**NBIO RAS Control [MCA]**
Configuration options: [MCA] [Legacy] [Disabled]

**Egress Poison Severity High**
This option allows you to set the Egress Poison Severity High value.

**Egress Poison Severity Low**
This option allows you to set the Egress Poison Severity Low value.

**NBIO SyncFlood Generation [Auto]**
Configuration options: [Disabled] [Enabled] [Auto]

**NBIO SyncFlood Reporting [Disabled]**
Configuration options: [Disabled] [Enabled]

**Egress Poison Mask High**
This option allows you to set the Egress Poison Mask High value.

**Egress Poison Mask Low**
This option allows you to set the Egress Poison Mask Low value.

**Uncorrected Converted to Poison Enable Mask High**
This option allows you to set the Uncorrected Converted to Poison Enable Mask High value.

**Uncorrected Converted to Poison Enable Mask Low**
This option allows you to set the Uncorrected Converted to Poison Enable Mask Low value.

**System Hub Watchdog Timer**
This option allows you to set the System Hub Watchdog Timer value.

**SLINK Read Response OK [Disabled]**
Configuration options: [Disabled] [Enabled]

**SLINK Read Response Error Handling [Log Error in MCA]**
Configuration options: [Log Error in MCA][Enabled] [Trigger MCOMMIT error]

**Log Poison Data from SLINK [Disabled]**
Configuration options: [Disabled] [Enabled]

**PCIe Aer Reporting Mechanism [Auto]**
Configuration options: [Firmware First] [OS First] [MCA] [Auto]

**Edpc Control [Disabled]**
Configuration options: [Disabled] [Enabled] [Auto]

**NBIO Poison Consumption [Auto]**
Configuration options: [Disabled] [Enabled] [Auto]

**Sync Flood on PCIe Fatal Error [Auto]**
Configuration options: [True] [False] [Auto]

## Enable AER Cap [Auto]
Configuration options: [Disabled] [Enabled] [Auto]

## Early Link Speed [Auto]
Configuration options: [Gen1] [Gen2] [Auto]

## Hot Plug Handling mode [Auto]
Configuration options: [A0 Mode] [OS First (No Error Handling)]
[OS First (Error Handling - Not Implemented)]
[Firmware First (Not Implemented)] [Auto]

## Presence Detect Select mode [Auto]
Configuration options: [OR] [AND] [Auto]

## 4.11.5 FCH Common Options

```
               Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
                                                                          AMD CBS

    FCH Common Options                                      SATA Configuration Options

  ▶ SATA Configuration Options
  ▶ USB Configuration Options
  ▶ SD Dump Options
  ▶ Ac Power Loss Options
  ▶ I2C Configuration Options
  ▶ Uart Configuration Options
  ▶ ESPI Configuration Options
  ▶ eMMC Options
  ▶ FCH RAS Options
```
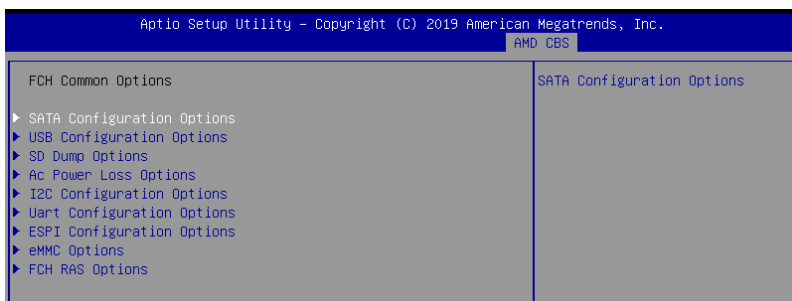
### USB Configuration Options

**XHCI Controller0 enable [Auto]**
Configuration options: [Disabled] [Enabled] [Auto]

**XHCI Controller1 enable [Auto]**
Configuration options: [Disabled] [Enabled] [Auto]

**USB ecc SMI Enable [Auto]**
Configuration options: [Off] [Enabled] [Auto]

**MCM USB**

       *XHCI2 enable (Socket1) [Auto]*
       Configuration options: [Disabled] [Enabled] [Auto]

       *XHCI3 enable (Socket1) [Auto]*
       Configuration options: [Disabled] [Enabled] [Auto]

# 4.11.6   NTB Common Options

```
            Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
                                                        AMD CBS
    NTB Common Options                                  Enable NTB

    NTB Enable                       [Auto]
```
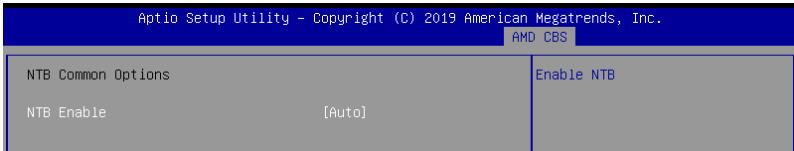
**NTB Enable [Auto]**
Configuration options: [Enabled] [Auto]

The following item appears only when **NTB Enable** is set to **[NTB Enable]**.

**NTB Location [Auto]**
Configuration options: [Auto] [Socket0-Die0] [Socket0-Die1] [Socket0-Die2]
                       [Socket0-Die3] [Socket1-Die0] [Socket1-Die1]
                       [Socket1-Die2] [Socket1-Die3]

**NTB active on PCIeCore [Auto]**
Configuration options: [Auto] [Core0] [Core1]

**NTB Mode [Auto]**
Configuration options: [NTB Disabled] [NTB Primary] [NTB Secondary]
                       [NTB Random] [Auto]

**Link Speed [Auto]**
Configuration options: [MAX Speed] [Gen 1] [Gen 2] [Gen 3] [Auto] [Gen 4]

# 4.12 Event Logs menu

The Event Logs menu items allow you to change the event log settings and view the system event logs.

```
              Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
    ◄ Event Logs   Server Mgmt

    ► Change Smbios Event Log Settings                        Press <Enter> to change the
    ► View Smbios Event Log                                   Smbios Event Log configuration.
```
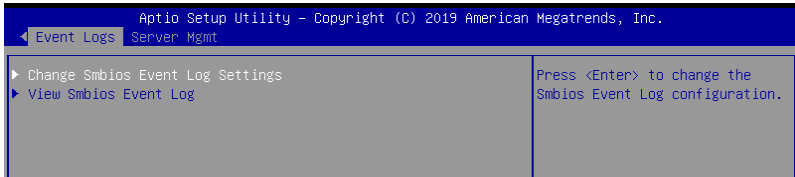
## 4.12.1 Change Smbios Event Log Settings

Press <Enter> to change the Smbios Event Log configuration.

All values changed here do not take effect until computer is restarted.

### Enabling/Disabling Options

#### Smbios Event Log [Enabled]
Change this to enable or disable all features of Smbios Event Logging during boot.
Configuration options: [Disabled] [Enabled]

### Erasing Settings

#### Erase Event Log [No]
Choose options for erasing Smbios Event Log. Erasing is done prior to any logging activation during reset.
Configuration options: [No] [Yes, Next reset] [Yes, Every reset]

### Smbios Event Log Standard Settings

#### Log System Boot Event [Disabled]
Allows you to choose options to enable/disable logging of System boot event.
Configuration options: [Enabled] [Disabled]

#### MECI [1]
Multiple Event Count Increment (MECI). The number of occurrences of a duplicate event that must pass before the multiple-event counter associated with the log entry is updated, specified as a numeric value in the range 1 to 255.

#### METW [60]
Multiple Event Time Windows (METW). The number of minutes which must pass between duplicate log entries which utilize a multiple-event counter. The value ranges from 0 to 99 minutes.

## 4.12.2 View Smbios Event Log

Press <Enter> to view all smbios event logs.

# 4.13    Server Mgmt menu

The Server Management menu displays the server management status and allows you to change the settings.

```
              Aptio Setup Utility – Copyright (C) 2019 American Megatrends, Inc.
  ◀ Event Logs   Server Mgmt

   BMC Self Test Status          PASSED                 Enable/Disable interfaces to
   BMC Device ID                 32                     communicate with BMC
   BMC Device Revision           1
   BMC Firmware Revision         1.14
   IPMI Version                  2.0
   BMC Interface(s)              KCS

   BMC Support                   [Enabled]
   Wait For BMC                  [Disabled]
   FRB-2 Timer                   [Enabled]
   FRB-2 Timer timeout           [6 minutes]
   FRB-2 Timer Policy            [Do Nothing]
   OS Watchdog Timer             [Disabled]
   OS Wtd Timer Timeout          [10 minutes]          ↔: Select Screen
   OS Wtd Timer Policy           [Reset]               ↑↓: Select Item
   Serial Mux                    [Disabled]            Enter: Select
                                                       +/-: Change Opt.
 ▶ System Event Log                                    F1: General Help
 ▶ Bmc self test log                                   F2: Previous Values
 ▶ View FRU information                                F5: Optimized Defaults
 ▶ BMC network configuration                           F10: Save & Reset
 ▶ View System Event Log                               F12: Print Screen
 ▶ BMC User Settings                                   ESC: Exit
 ▶ BMC Warm Reset


              Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.
```

**BMC Support [Enabled]**
Configuration options: [Disabled] [Enabled]

**Wait For BMC [Disabled]**
Configuration options: [Disabled] [Enabled]

**FRB-2 Timer [Enabled]**
Configuration options: [Disabled] [Enabled]

**FRB-2 Timer timeout [6 minutes]**
Configuration options: [3 minutes] [4 minutes] [5 minutes] [6 minutes]

**FRB-2 Timer Policy [Do Nothing]**
Configuration options: [Do Nothing] [Reset] [Power Down] [Power Cycle]

**OS Watchdog Timer [Disabled]**
This item allows you to start a BIOS timer which can only be shut off by Intel Management Software after the OS loads.
Configuration options: [Disabled] [Enabled]

The following items is configurable only when the **OS Watchdog Timer** is set to **[Enabled]**.

**OS Wtd Timer Timeout [10 minutes]**
Allows you to configure the length of the OS Boot Watchdog Timer.
Configuration options: [5 minutes] [10 minutes] [15 minutes] [20 minutes]

**OS Wtd Timer Policy [Reset]**
This item allows you to configure the how the system should respond if the OS Boot
Watch Timer expires.
Configuration options: [Do Nothing] [Reset] [Power Down]

## System Event Log
Allows you to change the SEL event log configuration.

**SEL Components [Enabled]**
This option allows you to enable or disable SEL Components.
Configuration options: [Disabled] [Enabled]

The following items is configurable only when the **SEL Components** is set to **[Enabled]**.

**Erase SEL [No]**
Allows you to choose options for erasing SEL.
Configuration options: [No] [Yes, On next reset] [Yes, On every reset]

**When SEL is Full [Do Nothing]**
Allows you to choose options for reactions to a full SEL.
Configuration options: [Do Nothing] [Erase Immediately]

**Log EFI Status Codes [Error code]**
Configuration options: [Disabled] [Both] [Error code] [Progress code]

## BMC self test log

**Erase Log [Yes, On every reset]**
Configuration options: [Yes, On every reset] [No]

**When log is full [Clear Log]**
Configuration options: [Clear Log] [Do not log any more]

## BMC network configuration
The sub-items in this configuration allow you to configure the BMC network parameters.

## View System Event Log
This item allows you to view the system event log records.

# Driver Installation

5

This chapter provides the instructions for installing the necessary drivers for different system components in the Windows® Operating System.

# 5.1    Running the Support DVD

The support DVD that is bundled with your motherboard contains drivers, management applications, and utilities that you can install to maximize the features of your motherboard.

1. The contents of the support DVD are subject to change at any time without notice. Visit the ASUS website (www.asus.com) for the latest updates on software and utilities.

2. The support DVD is supported on Windows® Server 2012 R2 and Windows® Server 2016.

The main screen of the Support DVD contains the following tabs:

1. Drivers - Shows the available device drivers that the system detects.

2. Utilities - Displays the software applications and utilities that the motherboard supports.

3. Manual - Provides the link to the user guide(s).

You need an internet browser installed in your OS to view the User Guide.
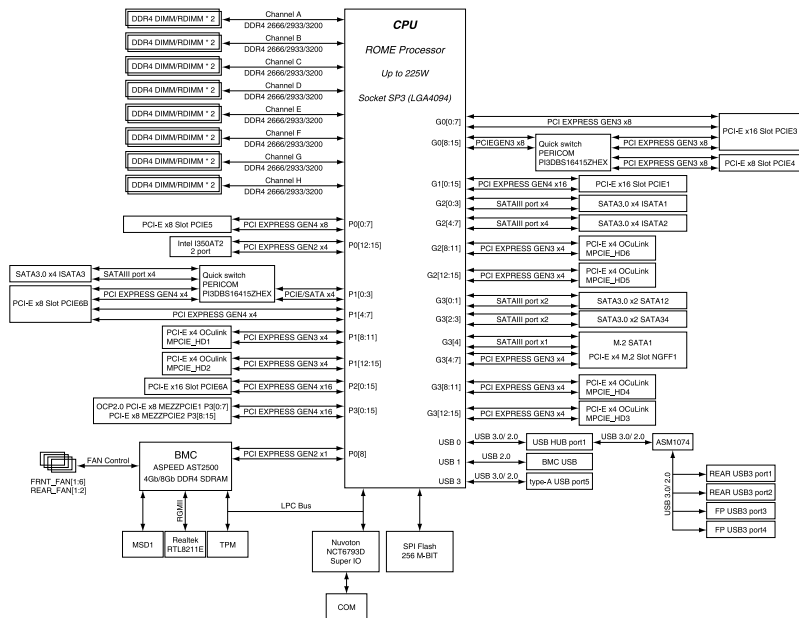
4. Contact - Displays the ASUS contact information, e-mail addresses, and useful links if you need more information or technical support for your motherboard.

# Appendix

A

This appendix includes additional information that you may refer to when configuring the motherboard.

# KRPA-U16 block diagram

**CPU**

ROME Processor

Up to 225W

Socket SP3 (LGA4094)

DDR4 DIMM/RDIMM * 2 — Channel A — DDR4 2666/2933/3200
DDR4 DIMM/RDIMM * 2 — Channel B — DDR4 2666/2933/3200
DDR4 DIMM/RDIMM * 2 — Channel C — DDR4 2666/2933/3200
DDR4 DIMM/RDIMM * 2 — Channel D — DDR4 2666/2933/3200
DDR4 DIMM/RDIMM * 2 — Channel E — DDR4 2666/2933/3200
DDR4 DIMM/RDIMM * 2 — Channel F — DDR4 2666/2933/3200
DDR4 DIMM/RDIMM * 2 — Channel G — DDR4 2666/2933/3200
DDR4 DIMM/RDIMM * 2 — Channel H — DDR4 2666/2933/3200

G0[0:7] — PCI EXPRESS GEN3 x8 — PCI-E x16 Slot PCIE3
G0[8:15] — PCIEGEN3 x8 — Quick switch PERICOM PI3DBS16415ZHEX — PCI EXPRESS GEN3 x8 — PCI-E x16 Slot PCIE1 / PCI EXPRESS GEN3 x8 — PCI-E x8 Slot PCIE4

G1[0:15] — PCI EXPRESS GEN4 x16 — PCI-E x16 Slot PCIE1
G2[0:3] — SATAIII port x4 — SATA3.0 x4 ISATA1
G2[4:7] — SATAIII port x4 — SATA3.0 x4 ISATA2
G2[8:11] — PCI EXPRESS GEN3 x4 — PCI-E x4 OCuLink MPCIE_HD6
G2[12:15] — PCI EXPRESS GEN3 x4 — PCI-E x4 OCuLink MPCIE_HD5
G3[0:1] — SATAIII port x2 — SATA3.0 x2 SATA12
G3[2:3] — SATAIII port x2 — SATA3.0 x2 SATA34
G3[4] — SATAIII port x1 — M.2 SATA1
G3[4:7] — PCI EXPRESS GEN3 x4 — PCI-E x4 M.2 Slot NGFF1
G3[8:11] — PCI EXPRESS GEN3 x4 — PCI-E x4 OCuLink MPCIE_HD4
G3[12:15] — PCI EXPRESS GEN3 x4 — PCI-E x4 OCuLink MPCIE_HD3

PCI-E x8 Slot PCIE5 — PCI EXPRESS GEN4 x8 — P0[0:7]
Intel I350AT2 2 port — PCI EXPRESS GEN2 x4 — P0[12:15]

SATA3.0 x4 ISATA3 — SATAIII port x4 — Quick switch PERICOM PI3DBS16415ZHEX
PCI-E x8 Slot PCIE6B — PCI EXPRESS GEN4 x4 — PCIE/SATA x4 — P1[0:3]
PCI EXPRESS GEN4 x4 — P1[4:7]
PCI-E x4 OCulink MPCIE_HD1 — PCI EXPRESS GEN3 x4 — P1[8:11]
PCI-E x4 OCulink MPCIE_HD2 — PCI EXPRESS GEN3 x4 — P1[12:15]
PCI-E x16 Slot PCIE6A — PCI EXPRESS GEN4 x16 — P2[0:15]
OCP2.0 PCI-E x8 MEZZPCIE1 P3[0:7] / PCI-E x8 MEZZPCIE2 P3[8:15] — PCI EXPRESS GEN4 x16 — P3[0:15]

**BMC**
ASPEED AST2500
4Gb/8Gb DDR4 SDRAM

FAN Control
FRNT_FAN[1:6]
REAR_FAN[1:2]

PCI EXPRESS GEN2 x1 — P0[8]

USB 0 — USB 3.0/ 2.0 — USB HUB port1 — USB 3.0/ 2.0 — ASM1074
USB 1 — USB 2.0 — BMC USB
USB 3 — USB 3.0/ 2.0 — type-A USB port5

USB 3.0/ 2.0 — REAR USB3 port1 / REAR USB3 port2 / FP USB3 port3 / FP USB3 port4

RGMII — LPC Bus

MSD1 — Realtek RTL8211E — TPM — Nuvoton NCT6793D Super IO — SPI Flash 256 M-BIT

COM

# Q-Code table

| Code | Description |
|------|-------------|
| 00 | Not used |
| 02 | microcode |
| 03 | CACHE_ENABLED |
| 04 | PCH initialization |
| 06 | CPU_EARLY_INIT |
| 10 | PEI Core is started |
| 11 – 14 | Pre-memory CPU initialization is started |
| 15 – 18 | Pre-memory System Agent initialization is started |
| 19 – 1C | Pre-memory PCH initialization is started |
| 2B – 2F | Memory initialization |
| 30 | Reserved for ASL (see ASL Status Codes section below) |
| 31 | Memory Installed |
| 32 – 36 | CPU post-memory initialization |
| 37 – 3A | Post-Memory System Agent initialization is started |
| 3B – 3E | Post-Memory PCH initialization is started |
| 4F | DXE IPL is started |
| 50 – 53 | Memory initialization error. Invalid memory type or incompatible memory speed |
| 4F | DXE IPL is started |
| 54 | Unspecified memory initialization error |
| 55 | Memory not installed |
| 56 | Invalid CPU type or Speed |
| 57 | CPU mismatch |
| 58 | CPU self test failed or possible CPU cache error |
| 59 | CPU micro-code is not found or micro-code update is failed |
| 5A | Internal CPU error |
| 5B | Reset PPI is not available |
| 5C – 5F | Reserved for future AMI error codes |
| E0 | S3 Resume is stared (S3 Resume PPI is called by the DXE IPL) |
| E1 | S3 Boot Script execution |
| E2 | Video repost |
| E3 | OS S3 wake vector call |
| E4 – E7 | Reserved for future AMI progress codes |
| E8 | S3 Resume Failed |
| E9 | S3 Resume PPI not Found |
| EA | S3 Resume Boot Script Error |
| EB | S3 OS Wake Error |
| EC – EF | Reserved for future AMI error codes |
| F0 | Recovery condition triggered by firmware (Auto recovery) |
| F1 | Recovery condition triggered by user (Forced recovery) |
| F2 | Recovery process started |
| F3 | Recovery firmware image is found |
| F4 | Recovery firmware image is loaded |
| F5 – F7 | Reserved for future AMI progress codes |
| F8 | Recovery PPI is not available |
| F9 | Recovery capsule is not found |

*(continued on the next page)*

| Code | Description |
|------|-------------|
| FA | Invalid recovery capsule |
| FB – FF | Reserved for future AMI error codes |
| 60 | DXE Core is started |
| 61 | NVRAM initialization |
| 62 | Installation of the PCH Runtime Services |
| 63 – 67 | CPU DXE initialization is started |
| 68 | PCI host bridge initialization |
| 69 | System Agent DXE initialization is started |
| 6A | System Agent DXE SMM initialization is started |
| 6B – 6F | System Agent DXE initialization (System Agent module specific) |
| 70 | PCH DXE initialization is started |
| 71 | PCH DXE SMM initialization is started |
| 72 | PCH devices initialization |
| 73 – 77 | PCH DXE Initialization (PCH module specific) |
| 78 | ACPI module initialization |
| 79 | CSM initialization |
| 7A – 7F | Reserved for future AMI DXE codes |
| 90 | Boot Device Selection (BDS) phase is started |
| 91 | Driver connecting is started |
| 92 | PCI Bus initialization is started |
| 93 | PCI Bus Hot Plug Controller Initialization |
| 94 | PCI Bus Enumeration |
| 95 | PCI Bus Request Resources |
| 96 | PCI Bus Assign Resources |
| 97 | Console Output devices connect |
| 98 | Console input devices connect |
| 99 | Super IO Initialization |
| 9A | USB initialization is started |
| 9B | USB Reset |
| 9C | USB Detect |
| 9D | USB Enable |
| 9E – 9F | Reserved for future AMI codes |
| A0 | IDE initialization is started |
| A1 | IDE Reset |
| A2 | IDE Detect |
| A3 | IDE Enable |
| A4 | SCSI initialization is started |
| A5 | SCSI Reset |
| A6 | SCSI Detect |
| A7 | SCSI Enable |
| A8 | Setup Verifying Password |
| A9 | Start of Setup |
| AA | Reserved for ASL (see ASL Status Codes section below) |
| AB | Setup Input Wait |

| Code | Description |
|---|---|
| AC | Reserved for ASL (see ASL Status Codes section below) |
| AD | Ready To Boot event |
| AE | Legacy Boot event |
| AF | Exit Boot Services event |
| B0 | Runtime Set Virtual Address MAP Begin |
| B1 | Runtime Set Virtual Address MAP End |
| B2 | Legacy Option ROM Initialization |
| B3 | System Reset |
| B4 | USB hot plug |
| B5 | PCI bus hot plug |
| B6 | Clean-up of NVRAM |
| B7 | Configuration Reset (reset of NVRAM settings) |
| B8– BF | Reserved for future AMI codes |
| D0 | CPU initialization error |
| D1 | System Agent initialization error |
| D2 | PCH initialization error |
| D3 | Some of the Architectural Protocols are not available |
| D4 | PCI resource allocation error. Out of Resources |
| D5 | No Space for Legacy Option ROM |
| D6 | No Console Output Devices are found |
| D7 | No Console Input Devices are found |
| D8 | Invalid password |
| D9 | Error loading Boot Option (LoadImage returned error) |
| DA | Boot Option is failed (StartImage returned error) |
| DB | Flash update is failed |
| DC | Reset protocol is not available |

**ACPI/ASL Checkpoints (under OS)**

| Code | Description |
|---|---|
| 03 | System is entering S3 sleep state |
| 04 | System is entering S4 sleep state |
| 05 | System is entering S5 sleep state |
| 30 | System is waking up from the S3 sleep state |
| 40 | System is waking up from the S4 sleep state |
| AC | System has transitioned into ACPI mode. Interrupt controller is in PIC mode. |
| AA | System has transitioned into ACPI mode. Interrupt controller is in APIC mode. |

# Notices

## Federal Communications Commission Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with manufacturer's instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

> The use of shielded cables for connection of the monitor to the graphics card is required to assure compliance with FCC regulations. Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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CAN ICES-3(B)/NMB-3(B)

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**Lietuvių** „ASUSTeK Computer Inc." šiuo tvirtina, kad šis įrenginys atitinka pagrindinius reikalavimus ir kitas svarbias susijusių direktyvų nuostatas. Visą ES atitikties deklaracijos tekstą galima rasti: www.asus.com/support

**Norsk** ASUSTeK Computer Inc. erklærer herved at denne enheten er i samsvar med hovedsaklige krav og andre relevante forskrifter i relaterte direktiver. Fullstendig tekst for EU-samsvarserklæringen finnes på: www.asus.com/support

**Polski** Firma ASUSTeK Computer Inc. niniejszym oświadcza, że urządzenie to jest zgodne z zasadniczymi wymogami i innymi właściwymi postanowieniami powiązanych dyrektyw. Pełny tekst deklaracji zgodności UE jest dostępny pod adresem: www.asus.com/support

**Português** A ASUSTeK Computer Inc. declara que este dispositivo está em conformidade com os requisitos essenciais e outras disposições relevantes das Diretivas relacionadas. Texto integral da declaração da UE disponível em: www.asus.com/support

**Română** ASUSTeK Computer Inc. declară că acest dispozitiv se conformează cerințelor esențiale și altor prevederi relevante ale directivelor conexe. Textul complet al declarației de conformitate a Uniunii Europene se găsește la: www.asus.com/support

**Srpski** ASUSTeK Computer Inc. ovim izjavljuje da je ovaj uređaj u saglasnosti sa osnovnim zahtevima i drugim relevantnim odredbama povezanih Direktiva. Pun tekst EU deklaracije o usaglašenosti je dostupan da adresi: www.asus.com/support

**Slovensky** Spoločnosť ASUSTeK Computer Inc. týmto vyhlasuje, že toto zariadenie vyhovuje základným požiadavkám a ostatým príslušným ustanoveniam príslušných smerníc. Celý text vyhlásenia o zhode pre štáty EÚ je dostupný na adrese: www.asus.com/support

**Slovenščina** ASUSTeK Computer Inc. izjavlja, da je ta naprava skladna z bistvenimi zahtevami in drugimi ustreznimi določbami povezanih direktiv. Celotno besedilo EU-izjave o skladnosti je na voljo na spletnem mestu: www.asus.com/support

**Español** Por la presente, ASUSTeK Computer Inc. declara que este dispositivo cumple los requisitos básicos y otras disposiciones pertinentes de las directivas relacionadas. El texto completo de la declaración de la UE de conformidad está disponible en: www.asus.com/support

**Svenska** ASUSTeK Computer Inc. förklarar härmed att denna enhet överensstämmer med de grundläggande kraven och andra relevanta föreskrifter i relaterade direktiv. Fulltext av EU-försäkran om överensstämmelse finns på: www.asus.com/support

**Українська** ASUSTeK Computer Inc. заявляє, що цей пристрій відповідає основним вимогам та іншим відповідним положенням відповідних Директив. Повний текст декларації відповідності стандартам ЄС доступний на: www.asus.com/support

**Türkçe** AsusTek Computer Inc., bu aygıtın temel gereksinimlerle ve ilişkili Yönergelerin diğer ilgili koşullarıyla uyumlu olduğunu beyan eder. AB uygunluk bildiriminin tam metni şu adreste bulunabilir: www.asus.com/support

**Bosanski** ASUSTeK Computer Inc. ovim izjavljuje da je ovaj uređaj usklađen sa bitnim zahtjevima i ostalim odgovarajućim odredbama vezanih direktiva. Cijeli tekst EU izjave o usklađenosti dostupan je na: www.asus.com/support

# ASUS contact information

## ASUSTeK COMPUTER INC.

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### *Technical Support*

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Fax              +86-21-58668722 ext: 9101
Online Support   https://www.asus.com/support/Product/ContactUs/Services/
                 questionform/?lang=en

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                 questionform/?lang=zh-tw

## ASUSTeK COMPUTER INC. (China)

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Online Support   https://www.asus.com/support/Product/ContactUs/Services/
                 questionform/?lang=zh-cn

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# ASUS contact information

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                       questionform/?lang=en-us

## ASUS COMPUTER GmbH (Germany and Austria)

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### *Technical Support*

Telephone              +49-1805-010923
Support Fax            +49-2102-959911
Online support         https://www.asus.com/support/Product/ContactUs/Services/
                       questionform/?lang=de-de

## ASUS Czech Service s.r.o. (Europe)

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                       Czech Republic
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Web site               https://www.asus.com/cz/

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E-mail                 advance.rma.eu@asus.com
Online Support         https://www.asus.com/support/Product/ContactUs/Services/
                       questionform/?lang=cs-cz

# ASUS contact information

## ASUS Holland BV (The Netherlands)

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Fax                        +31-(0)591-666853
E-mail                     advance.rma.eu@asus.com
Online Support             https://www.asus.com/support/Product/ContactUs/Services/
                           questionform/?lang=nl-nl

## ASUS Polska Sp. z o.o. (Poland)

Address                    Ul. Postępu 6, 02-676 Warszawa, Poland
Web site                   https://www.asus.com/pl/

### *Technical Support*

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Online Support             https://www.asus.com/support/Product/ContactUs/Services/
                           questionform/?lang=pl-pl

## ASK-Service (Russia and CIS)

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Telephone                  (495) 640-32-75
Web site                   https://www.asus.com/ru/

### *Technical Support*

Telephone                  008-800-100-ASUS (008-800-100-2787)
Online Support             https://www.asus.com/support/Product/ContactUs/Services/
                           questionform/?lang=ru-ru